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Community Choice Aggregation in Torrance, CA

A Pre-Feasibility Study done by USC Price School of Public Policy

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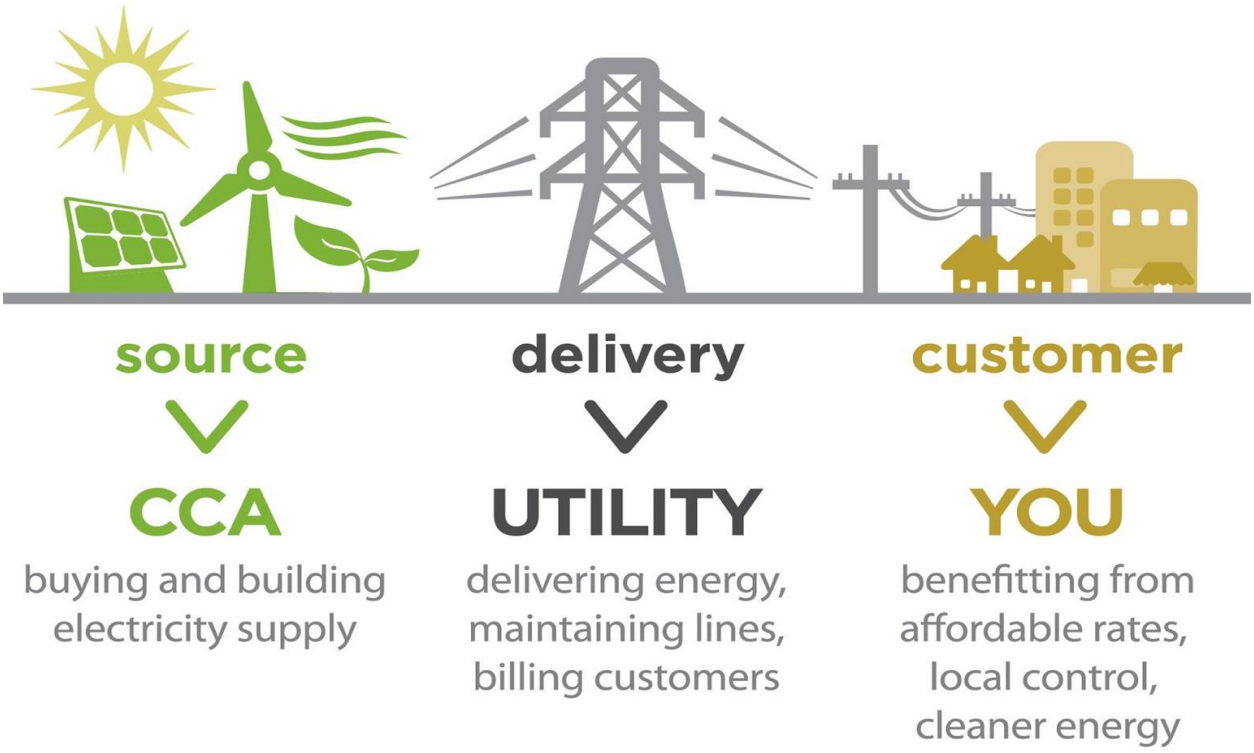
Executive Summary

This report, done by four Graduate Students at the University of Southern California's Price School of Public Policy is designed to answer the following question: What is the political, fiscal, and capacity feasibility of the City of Torrance leaving the current Investor Owned Utility and joining or starting an independent Community Choice Aggregation in the South Bay region of Los Angeles? CCAs are a tool in which cities, counties, or regions can join their purchasing power together to acquire cleaner and more renewable energy to provide to its residents, taking much of the power away from Investor Owned Utilities. While CCAs are a relatively new concept in California, several key successes in Northern California have propelled the interest in the wide-spread formation of similar CCAs in the rest of the state. The City of Torrance has asked a group of students from the USC MPA Capstone class to investigate the practice of Community Choice Aggregations country-wide, while focusing specifically on several key regions within the state of California. This report seeks to define the practice of Community Choice Aggregation, explore the potential benefits and pitfalls, and provide a preliminary recommendation of how the City of Torrance should proceed on the topic. From the analysis, three specific benefits were projected: financial benefit to the JPA, jobs created in developing additional renewable energy, and averted greenhouse gas emissions.



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Definitions

CCA – Community Choice Aggregation (also known as Municipal Aggregation) allows local governments and some special districts to pool (or aggregate) their electricity load in order to purchase and/or develop power on behalf of their residents, businesses, and municipal accounts. Established by law in six states thus far (California AB 117 and SB 790), CCA is an energy supply model that works in partnership with the region's existing utility which continues to deliver power, maintain the grid, and provide customer service and billing.

Economic Impact – overall impact to the energy rates to consumers and dividends to the jurisdiction, as well as impact to local jobs and development of energy infrastructure needed to support the new local production of renewable energy.

Feed-In Tariff -- a policy that requires electric utility providers to pay established above market prices for renewable energy generated onto the grid

GHG - A Greenhouse Gas is a gas that absorbs infrared (IR) radiation and trap heat in the atmosphere. Carbon dioxide (CO2) is the major greenhouse gas emitted as a result of human activity.

IOU – Investor Owned Utilities is an organization which (for our purposes) provides electrical and gas services to the public. They are allowed certain monopoly rights due to the practical need to service entire geographic areas with one system, but they are regulated by state, county, and/or city public utility commissions under state laws.

JPA – a Joint Powers Authority is a collaboration between agencies across distinct local/state governments

LCCA – Lancaster Community Choice Aggregation

LEAN Energy – The Local Energy Aggregation Network (LEAN) is a non-profit, membership organization dedicated to the accelerated expansion and competitive success of clean energy CCA nationwide. LEAN provides support to cities and communities that are considering and going forward with CCAs.

MCE – Marin Clean Energy

MW (megawatt) – A unit of electrical power that expresses the capacity (or power rating) of power plants or consuming devices.

Net Metering – a program that that allows customers to earn a financial credit for energy generated from their on-site system and input to the utility. The credit is applied to the consumer's monthly bill.

PG&E – Pacific Gas and Electric Company. Investor Owned Utility for Northern California.

RFP – Requests for Proposal is a document issued to elicit bids from vendors, generally for the development of business component. During the formation process, the CCA agency will issue a RFP to elicit bids from energy suppliers.

RPS – Renewables Portfolio Standard – Established in 2002 under Senate Bill 1078, accelerated in 2006 under Senate Bill 107 and expanded in 2011 under Senate Bill 2, California's Renewables Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country. The RPS program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33percent of total procurement by 2020.

SCE – Southern California Edison. Investor Owned Utility for Southern California excluding San Diego.

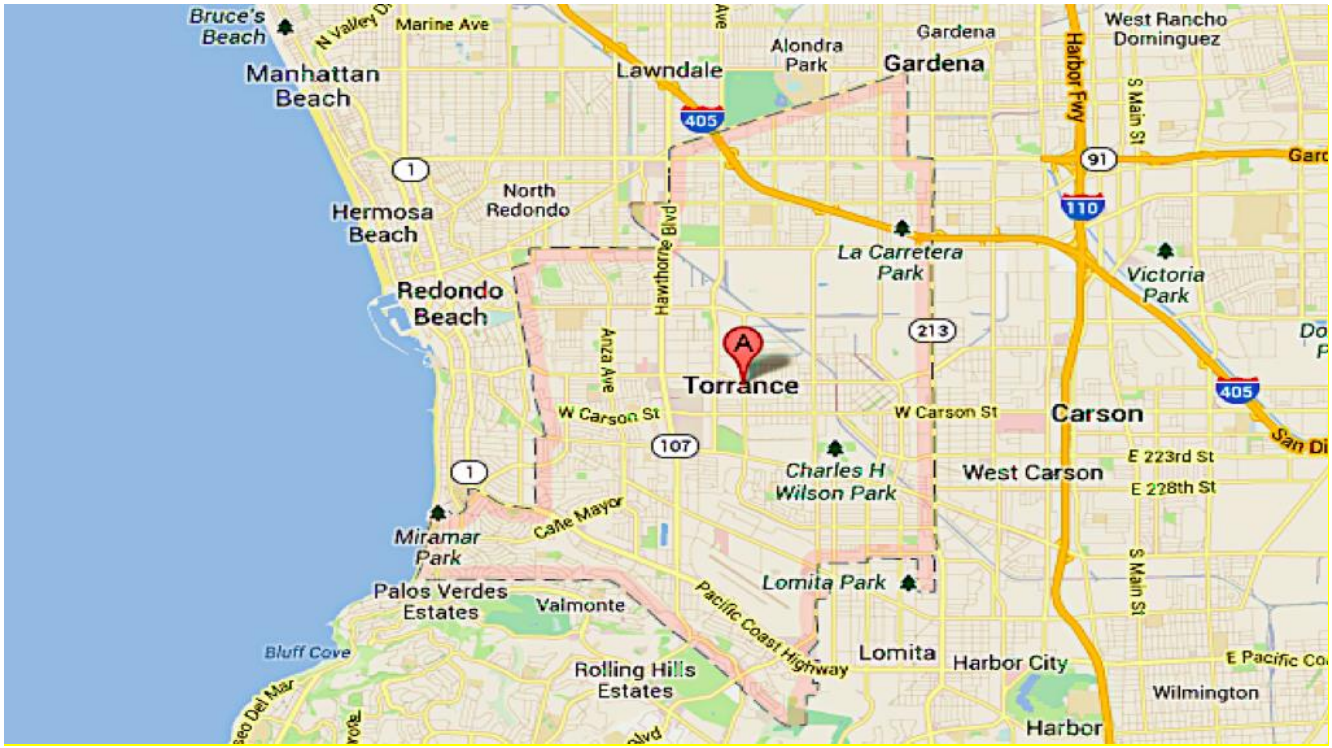
SCP – Sonoma Clean Power

Overview of Torrance

Located in southwestern Los Angeles County, the City of Torrance is a coastal community founded in 1912 with a population of 145,438 according to the 2010 United States Census. The population density is 7,076.1 people per square mile. The demographic makeup of Torrance is 42.3 percent White, 34.5 percent Asian, 16 percent Hispanic of Latino, 2.7 percent African American, and 4.5 percent other. Torrance has a strong manufacturing economy, especially in the areas of auto and aerospace manufacturing. Torrance is also known for its oil production, with a large Exxon refinery producing much of Southern California's gasoline supply.

The City of Torrance is a Charter city with a Council/Manager form of government. The elective officers of the City are the Mayor, six members of the City Council, five members of the Board of Education, the City Clerk and the City Treasurer. Using the Council/Manager form of government, the City Council, as the elected body, adopts legislation, sets policy, adjudicates issues, and establishes the budget of the City.[1]

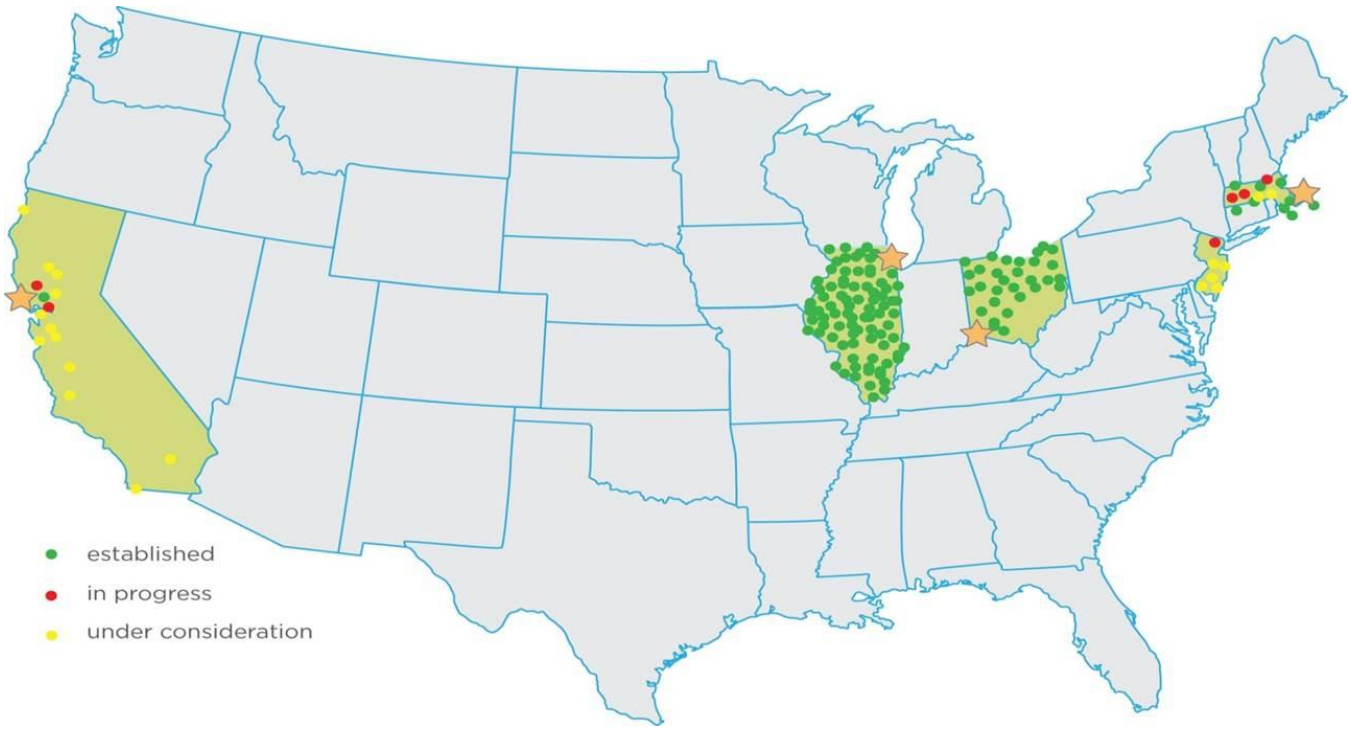
The mission of the City of Torrance is to encourage and respond to community participation as it provides for an attractive, clean, safe, secure and enriching environment that assures a high quality of life.



[1] (City of Torrance, 2014)

History of Community Choice Aggregation

While the idea of Community Choice Aggregation is still in its relatively early stages, several states have taken the lead in pursuing a new alternative to Investor Owned Utilities that must answer to their stockholders. Starting in the mid-1990s, Massachusetts led the way, closely followed by several other key states. Although legislation was passed more than 12 years ago, California is the latest state to pass legislation allowing for this type of policy. Only recently have communities taken the opportunity, but the numbers are continuing to rise.



CCAs around the Country

Massachusetts – The first CCA legislation in the country was enacted in 1997.[2] However, Massachusetts encountered significant opposition from the incumbent utilities. A decade later, the utilities have come to accept CCA as a viable generation and procurement model.[3]

Ohio – Northeast Ohio Public Energy Council formed the nation's largest CCA in 1999. Local communities are allowed by law to buy natural gas and electricity collectively to solicit the lowest price, which strengthened the buying power of the citizens.[4]

[2] (Massachusetts Senate Energy Committee, 1997)
[3] (Marshall, 2010)

Rhode Island – Since its inception in July 1999, Rhode Island Energy Aggregation Program (REAP) has saved its 36 member cities, towns and other municipal entities over $38 million in their costs for electricity.[5] Unlike other CCA programs around the country, Rhode Island launched the CCA with no green power options.[6]

Illinois – The CCA law was passed in 2009. Since then, the aggregation has been growing fast, from 20 communities to over 650. Programs around the state are increasing rapidly, yet renewable energy standards remain low at 8 percent in 2013.[7]

New Jersey – The state passed legislation in 2003, yet the process has been gradual. In New Jersey, it is prohibited for the municipal governments to contract directly for power. Instead, a third party energy supplier who meets the stated requirements contracts directly with residents and business customers.

CCAs in California

Implemented

Marin County – After California CCA legislation was passed in 2002, Marin Clean Energy (MCE) became the first program to launch in May 2010. The law mandates that all residents within the community are automatically enrolled into the program, allowing for "opt-outs" if consumers do not wish to take part. During the past four years, the program has been able to offer similar rates to that of PG&E.[8]

Sonoma County – In 2014, Sonoma Clean Power (SCP) became the second CCA launched in California. Formation began in December 2012 following the Water Agency's Board of Directors approval for the formation of the joint powers authority (JPA).[9]

Investigating

While there are many communities around the state that are exploring the idea of CCAs, Lancaster and Monterey Bay are the closest the launch. Both are expected to start serving customers in 2015.

Lancaster – In May 2014, the City Council approved an ordinance declaring the City's intent to explore the establishment of a CCA. The rates will be competitive, and determined by the council. Additionally Southern California Edison (SCE) will continue to provide energy transportation and billing services.[10]

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[4] (The Public Utilities Commission of Ohio, n.d.)
[5] (Rhode Island Energy Aggregation Program, 2014)
[6] (U.S. Department of Energy, 2014)
[7] (LEAN Energy U.S., n.d.)
[8] (National Association of Counties, 2014)
[9] (Sonoma County Water Agency, 2014)
[10] (Lancaster Choice Energy, 2014)

Monterey Bay – The Monterey Bay Region has gathered support for a Community Choice Aggregation feasibility study. All eighteen cities and three counties in the Monterey Region have approved participation. The evaluation of the feasibility study is going to be completed by June 2015.[11]

Suspended

San Francisco – This is one of two cases in California in which a CCA failed to be implemented. The CCA effort in San Francisco was directed by CleanPowerSF and began 2004. Different from other CCAs, which were created to reduce consumer costs, San Francisco's CCA was focused on green energy and set a goal of 100 percent renewable power. Ten years after the approval of the CCA, with an expense of more than $4.1 million to compete with PG&E, the work of CleanPowerSF was suspended.

San Joaquin Valley – Approved by the CPUC in 2007, the San Joaquin Valley CCA stumbled when attempting to implement its program. The CCA became embroiled in a legal battle with PG&E involving the marketing tactics employed by the incumbent utility. The economic recession in 2008 also affected the program's ability to find financing to support the launch. The pressures from PG&E and the recession forced the program into suspension in 2009.

[11] (Monterey Bay Community Power, 2014)

Case Studies

While an effort was made to learn further information about the CCAs that have been formed in the other states that allow for this kind of policy, in-depth case study analyses were only done for CCAs inside California, due to the differences in economic factors between California and the rest. While all five other states allow for open-market competition amongst energy suppliers, California has a closed-market system after deregulation failed many years ago. Because of this fact, California only has three major energy suppliers—PG&E, SCE, and San Diego Gas & Electric—creating an oligopolistic system that does not allow for competition of rates to consumers. The information gleaned from these California case studies will be more relevant for the City of Torrance.

Marin Clean Energy

Formed in 2008, Marin Clean Energy (MCE) was the first CCA program in the state of California. At its inception, eight of the twelve municipalities within Marin County were members of the public agency: Sausalito, Tiburon, San Rafael, San Anselmo, Mill Valley, Fairfax, Belvedere, and the county of Marin. These founding members worked together to submit their Community Choice Aggregation Implementation Plan and Statement of Intent to the California Public Utilities Commission in December 2009. Upon approval, the agency officially launched and began serving customers in May 2010. The agency expanded the following year with the additions of four more municipalities: Corte Madera, Ross, Larkspur, and Novato. Further expansion continued in 2012 with the addition of the City of Richmond. The agency continues to receive expansion requests from interested municipalities and just recently in 2014 approved the addition of Napa County.[12]

During its initial years, the agency had to manage strong opposition from the incumbent utility, PG&E. A reported $4.1 million was spent by PG&E to oppose the agency's launch and customer expansion. This expenditure is not included in the $46 million that PG&E spent in 2010 to support Proposition 16, which proposed a two-thirds supermajority vote for a municipality to establish a community choice aggregation system.[13] PG&E claimed that the money spent during the MCE's launch was to ensure that their customers were provided with the proper information to make educated decisions regarding their energy service provider. Throughout the opt-out time period of the 2010 launch, PG&E conducted phone banking and direct mail tactics to encourage former customers to opt out of MCE service. Many of these phone calls

[12] (Marin Clean Energy, 2014)
[13] (Halstead, 2011)

and mailings were reported to be misleading and inaccurate regarding MCE's electrical rates, which resulted in many people opting out of the service under false pretenses.[14]

Despite this opposition, the agency reported a 16 percent opt-out rate during its first initial customer enrollment phase. This percentage rate was below the estimated 25 percent opt-out rate projected for in the Implementation Plan.[15] The agency was able to move forward with its planned enrollment phases. Phase 1 began in 2010 with the enrollment of 9,000 municipal and commercial accounts; Phase 2, which lasted from 2011 to 2012, enrolled 80,000 commercial and residential accounts; and Phase 3, beginning in 2013 and continuing today will enroll all remaining and future customers, including the City of Richmond and Napa County. Today, the agency serves roughly 125,000 customers in Marin and Richmond, with an opt-out rate that has stayed below 25 percent (See Figure 1below).[16]

MCE Enrollment Percentage

	Opt-in %	Opt-out%
Overall MCE Enrollment %	76.40%	23.60%
Marin MCE Enrollment%	74%	26%
Richmond MCE Enrollment%	82.50%	17.50%

Source: The City of Hermosa Beach: Assessing Community Choice Aggregation

Figure 1
Marin Clean Energy Enrollment Percentage

The agency provides three energy plans for customers to choose. The Light Green option delivers energy that is 50 percent renewable. This is the plan that Marin and Richmond residents are automatically enrolled in if they have an account with PG&E. The plan currently offers the majority of its renewable energy content through wind (33 percent) and eligible hydroelectric (12 percent). The Deep Green plan provides 100 percent renewable energy. Customers have to opt-in to this plan and have to pay a premium that has averaged around $5 to receive this service. Half of the revenues earned through the Deep Green plan are directed to a fund that supports new, local renewable energy projects. Currently, 100 percent of the renewable energy for this plan is derived from wind power (See Figure 2).[17] By 2013, Deep Green customers accounted for 2 percent of the agency's overall customer base. The most recent plan offered by the agency is Sol Shares, a plan that offers 100 percent energy through a local solar farm. The plan is limited to only 200 participants and the cost is currently 30 percent more than the rates for Deep Green.

[14] (Dunleavy, 2010)
[15] (Loceff, 2010)
[16] (Jensen, 2014)
[17] (Marin Clean Energy, 2014)

Marin Clean Energy Sources of Renewable Energy

Specific Purchases	PG&E	MCE Light Green	MCE Deep Green
Renewable	22%	51%	100%
Biomass & Biowaste	4%	6%	0%
Geothermal	5%	0%	0%
Eligible Hydroelectric	2%	12%	0%
Solar electric	5%	<1%	0%
Wind	6%	33%	100%
Coal	0%	0%	0%
Large hydroelectric	10%	10%	0%
Natural gas	28%	0%	0%
Nuclear	22%	0%	0%
Other	0%	0%	0%
Unspecified sources of power	18%	39%	0%
Total	100%	100%	100%

Source: PG&E-Community Choice Aggregation,http://www.pge.com/en/myhome/customerservice/energychoice/communitychoiceaggregation/index.page

Figure 2
Marin Clean Energy Sources of Renewable Energy

Throughout the course of its history, the agency has been able to offer competitive rates compared to PG&E. In fact, even when accounting for the service fee charged to MCE customers, the electrical rates are often lower than PG&E's rates. The agency sets its rates annually by the MCE's Board of Directors, an assembly of local public officials that must request public approval before rate changes are implemented.[18] In 2014, the average MCE residential customer will pay a monthly bill of $85.60, which is $2.10 lower than the average PG&E residential customer (See Figure 3). For the average commercial customer, MCE charges $13.96 a month less than PG&E. These lower rates are expected to save MCE customers $5.9 million in 2014.[19]

[18] (Marin Clean Energy, 2014)
[19] (Seidman, 2014)

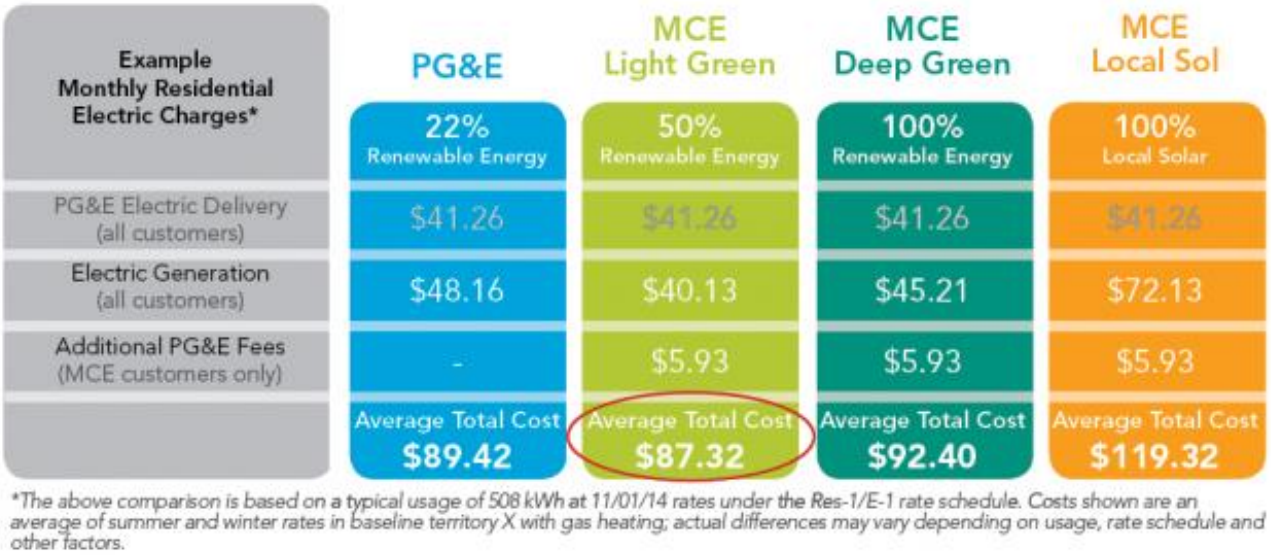

Figure X-3
Comparison of PG&E and MCE rates

The agency has grown rapidly since its inception in 2010. Nearing the completion of the Phase 3 enrollment plan, and with the recent additions of Richmond and Napa County, the agency has seen its revenues grow from $22.9 million in 2012 to $85.5 million in 2014. Operating expenses have grown commensurately as well; the agency reported expenses of $19.3 million in 2012 and $83.9 million in 2014.[20] (See Figure 4).

	2014	2013	2012
Operating revenues	$ 85,561,759	$ 52,579,310	$ 22,918,843
Contributions received	-	20,000	-
Interest income	8,965	900	-
Total income	85,570,724	52,600,210	22,918,843
Operating expenses	83,731,036	48,429,076	19,210,349
Interest expense	194,526	176,185	109,407
Total expenses	83,925,562	48,605,261	19,319,756
Increase (decrease) in net position	$ 1,645,162	$ 3,994,949	$ 3,599,087

Figure 4
MCE Operations[21]

The majority of operating expenses are a result of the cost of electricity; yet contract services and staff

[20] (Marin Clean Energy, 2014)
[21] (Marin Clean Energy, 2014)

compensation are also growing. The agency currently employs 20 full-time staff members and 2 part-time members for staffing plan (See Figure 5). Despite these added expenses, the increase in MCE accounts, and the subsequent electricity sales have allowed the agency to report profits in the last three years.[22]

Staffing for Marin Clean Energy	Full Time Positions
Management	
Executive Officer	1
Internal Operations	
Director of Internal Operations	1
Business Analyst	1
Human Resources Coordinator	0.5
Administrative Assistant	1
Clerk	1
Public Affairs	
Communications Director	1
Manager of Account Services	1
Community Affairs Coordinator	1
Communications Associate	1
Account Manager	2
Energy Efficiency	
Energy Efficiency Director	1
Energy Efficiency Specialist	2
Legal and Regulatory	
Legal Director	1
Regulatory Counsel	1
Regulatory Analyst	1
Regulatory Assistant	1
Electric Supply	
Director of Power Resources	1
Program Specialist	1
Special Assignment Intern	0.5
Total Staffing	21
Source: Marin Energy Authority, 2011	

Figure 5
Staffing for Marin Clean Energy

Sonoma Clean Power

In early 2011, the Board of Directors at the Sonoma County Water Agency recommended that the Water Agency explore the feasibility of forming a Community Choice Aggregation (CCA) system. In December 2012, the Board of Directors at the Water Agency officially agreed to the formation of a JPA with the

[22] (Marin Clean Energy, 2014)

County of Sonoma and the participating municipalities of Sonoma, Santa Rosa, Cotati, Windsor, and Sebastopol. The JPA, which became known as the Sonoma Clean Power Authority and later shortened to Sonoma Clean Power (SCP), formed with the intent of implementing a CCA system for the county and the participating municipalities. The formation of SCP was greatly influenced by LEAN Energy, a not-for-profit organization stemming from the success of Marin Clean Energy. In May 2014, Sonoma Clean Power began enrolling customers for service, becoming the second operational CCA in California, and is already expanding its service with the addition of the Cloverdale municipality in June 2014 and the potential additions of Petaluma and Rohnert Park.[23]

Similar to the MCE, Sonoma Clean Power is a not-for-profit agency that is independently run by its participating members with the purpose of providing electricity from renewable and more local sources. The agency sources power from renewables such as solar, wind, geothermal, and hydropower at a competitive price compared to the energy provided by the incumbent utility, PG&E. Looking to the MCE as a model, the agency has borrowed heavily from Marin's implementation plan and operational decisions, included following closely to the phase-in plan implemented by MCE. Currently in Phase 1, the agency will enroll up to 20,000 municipal and commercial accounts by the end of 2014. Beginning in 2015, Phase 2 will begin with the enrollment of 60,000 commercial and residential accounts. The final enrollment, Phase 3, will begin in 2016 with the enlistment of all remaining accounts.[24]

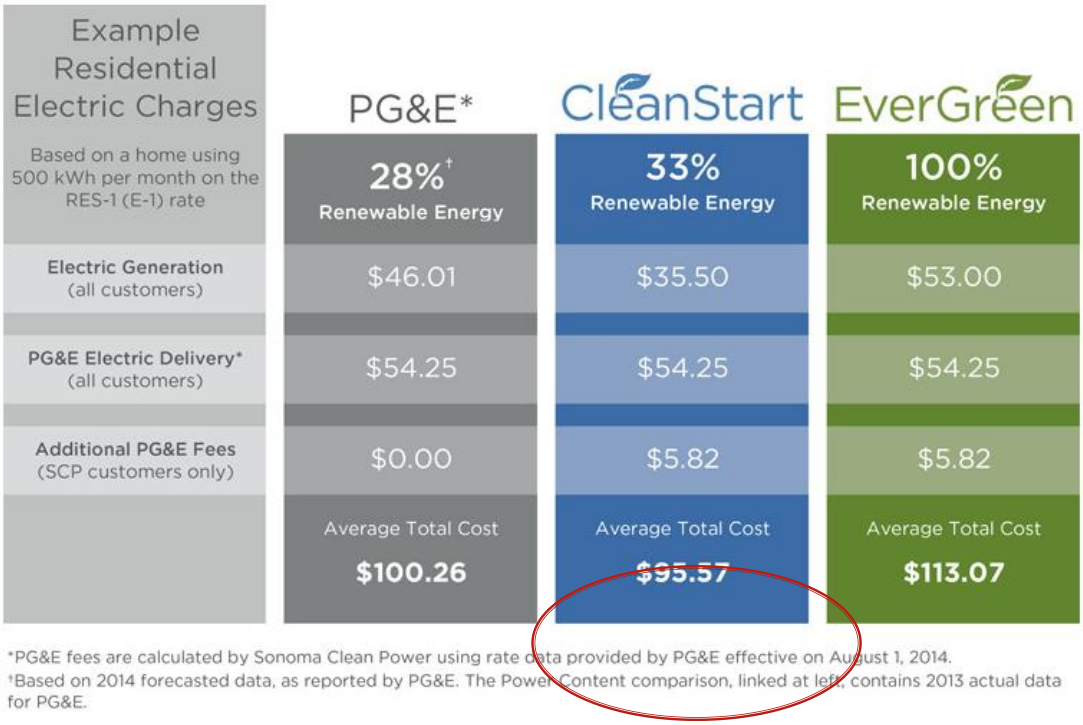

Figure 6
Comparison of PG&E and SCP rates

[23] (Sonoma Clean Power, 2014)
[24] (Sonoma Clean Power, 2013)

The agency will offer customers two service options: the CleanStart and EverGreen program. The CleanStart program offers customers 33 percent renewable energy, which already meets the California Renewables Portfolio Standard (RPS) 2020 requirement of 33 percent and is more than PG&E's current renewable energy offering of 23.8 percent. By 2018, the CleanStart program plans to have increased its renewable energy offering to 50 percent. Customers within the agency's service territory are automatically enrolled in the CleanStart program and must choose to join the EverGreen program if wanting an increased amount of renewable energy. The 2014 CleanStart rates are on average 4 to 5 percent lower than PG&E's rates.[25] The EverGreen program offers customers 100 percent local, renewable energy with customers in 2014 paying a premium of roughly 20 percent more compared to the CleanStart service. Upon joining EverGreen, customers will be making a twelve-month commitment in order to ensure the purchase of local power for all customers. By the launch date of May 1, 2014, the CleanStart program saw an opt-out rate of 11 percent, surprisingly lower than the anticipated 25-30 percent, and the EverGreen program had over 200 customers enrolled. According to the agency's CEO, Geof Syphers, both programs are estimated to save customers $6 million collectively in 2014.[26]

Sonoma Clean Power also offers customers two programs to take advantage of personal renewable energy generation systems. NetGreen is net energy metering program that allows customers to receive a dollar credit at full retail value if their individual system generates more electricity than used in a given month. If the customer uses more energy than the system produced, then the credit is applied to the monthly bill with the customer responsible for paying the remaining amount. Unused energy credits will roll over each month and will not expire. ProFIT is a Feed-In Tariff program offered by Sonoma Clean Power that allows the agency to purchase energy from small-scale renewable electricity installations within the service territory. This program incentivizes the development of local, renewable energy generation projects by setting a fixed price of $95/megawatt-hour (MWh) with set contracts ranging from 10 to 20 years.[27]

The agency receives most of its renewable energy through geothermal power, which constitutes 15 percent of CleanStart's renewable energy composition and 100 percent of EverGreen's energy mixture. Wind and biomass/bio waste, both at 9 percent each, also make up CleanEnergy's renewable energy portfolio (See Figure 7). Two recent deals have bolstered the agency's goal of increasing its local, renewable energy content. In October 2014, the agency signed a ten-year contract for geothermal power from Calpine's Geysers facilities in Sonoma County for volumes increasing to 50 megawatts by 2018. Additionally in October 2014, the agency signed a twenty-year contract with the local solar provider, Recurrent Energy, which adds 40 megawatts to the previous 30 megawatts that was purchased in September 2014.[28]

[25] (Sonoma Clean Power, 2014)
[26] (Wood, 2014)
[27] (Sonoma Clean Power, 2014)
[28] (Recurrent Energy, 2014)

Sonoma Clean Power

Specific Purchases	PG&E	SCP Light Green	SCP Deep Green
Renewable	22%	33%	100%
Biomass & Biowaste	4%	9%	0%
Geothermal	5%	15%	100%
Eligible Hydroelectric	2%	0%	0%
Solar electric	5%	0%	0%
Wind	6%	9%	0%
Coal	0%	0%	0%
Large hydroelectric	10%	37%	0%
Natural gas	28%	0%	0%
Nuclear	22%	0%	0%
Other	0%	0%	0%
Unspecified sources of power	18%	30%	0%
Total	100%	100%	100%

Source: PG&E-Community Choice Aggregation,
http://www.pge.com/en/myhome/customerservice/energychoice/communitychoiceaggregation/index.page

Figure 7
Sonoma Clean Power
Portfolio of Renewable Energy Sources

Lancaster Choice Energy

Lancaster, CA has taken the lead as the first Southern California jurisdiction to move forward with plans for implementation of a CCA. With around 150,000 residents and a history of being proactive in creating sustainable living in their community, Lancaster set a goal of being the nation's first net-zero city.[29] While already a global leader in the construction of sustainable structures, the City decided the next step would be to implement choice energy in the city. Lancaster completed an initial feasibility study in July 2013 which found numerous benefits of Community Choice Aggregation. As a result, the Lancaster City Council passed Ordinance 997 in May 2014, which established a non-profit entity to serve as the authority for overseeing the new CCA and adopted an Implementation Plan simultaneously. Dubbed the Lancaster Choice Energy (LCE), the non-profit established a timeline for implementing the CCA similar to the previously established Marin Clean Energy and Sonoma Clean Power.

While LCE is a member of LEAN Energy, the CCA used LEAN in a background capacity more so than the consultant work used by currently established CCA in Sonoma. According to Deputy City Manager, Jason Caudle, the organizational culture of the City of Lancaster has established a president of dealing with

[29] (Lancaster Choice Energy, 2014)

projects on their own, and with careful consideration of partners.[30] Using the templates laid out by the established CCAs in Northern California, Lancaster decided to implement their community choice without spending additional money hiring a consultant. As Lancaster has found, as each new entity successfully implements a CCA, the process gets easier and initial costs are reduced.

Seeking to phase the project in, timelines were set for implementing the CCA in three steps: starting with all municipal buildings by May 2015, leading to Commercial properties 6 months later, and ending with residential customers in May or November 2016. Customers will be provided with at least 2 notices allowing for opt-out of the program. The City anticipates roughly 50,000 customers to participate when everything is fully implemented. So far there has not been any opposition from the community, though the electrical union's attorneys sent letters challenging the plans for implementing a CCA. The International Brotherhood of Electrical Workers (IBEW) claimed that the City had not performed a CEQA analysis, but because this is a policy, not a physical project, there was no need for Lancaster to perform this step. Once this was clarified, the unions backed off. Additionally, Lancaster claims to have a great relationship in the process with Southern California Edison, unlike the pushback that came from PG&E in the north.

While Lancaster created a CCA by itself, the formation of a JPA allows other cities to join with them in the future for greater purchasing power. Although only in the preliminary stages, the City of Palmdale is amongst those considering joining this newly-formed JPA. The current plan for purchasing energy is a more complex situation, with not a great deal of local options for energy supply, leading Lancaster to reach out to other locations for the renewable energy. However, the big plan for the City is creating infrastructure to contain large quantities of the renewable energy, and is looking to some residents to provide on-site production of solar that can be bought by LCE.[31] Currently, Edison will only buy back energy at wholesale rates but LCE will purchase excess-generated energy at market rate. This is yet another way the City can accumulate the surplus that is already being produced by many of these customers, and provide additional revenue to those who can produce high-enough levels of electricity.

Monterey Bay Community Power

After the passing of legislation as the State Capitol, local volunteers and supporters of Community Choice pushed for a CCA to be formed in the Monterey Bay Region. After the successes of Marin Clean Energy and Sonoma Clean Power, a group of cities and counties south of the San Francisco Bay Area garnered support for an exploration into the options that a CCA would present to their communities. Monterey Bay Community Power was formed, which sought the help of LEAN Energy to help them garner support and fight for their cause. Because of LEAN's successes in the Northern Bay Area, costs were much lower than anticipated. While budgeting for $300,000 for initial community outreach and political lobbying, the costs

[30] (Caudle, 2014)
[31] (Caudle, 2014)

were only around $150,000.[32]

After extensive community involvement and support, Santa Cruz, San Benito, and Monterey Counties, along with their 18 incorporated cities passed resolutions in support of a Technical Feasibility Study for the Monterey Bay CCA. The Feasibility Study was done at two levels, the first at a regional level for the entire area, and the second to be a set of smaller studies done at the county level. Using state grants and around $400,000 from the public and private sectors, they were able to complete these studies in June 2014. The studies are currently under review by the Monterey Bay CCA Partners (See Figure 8 below).[33] If implemented, this CCA would become the largest in the state.

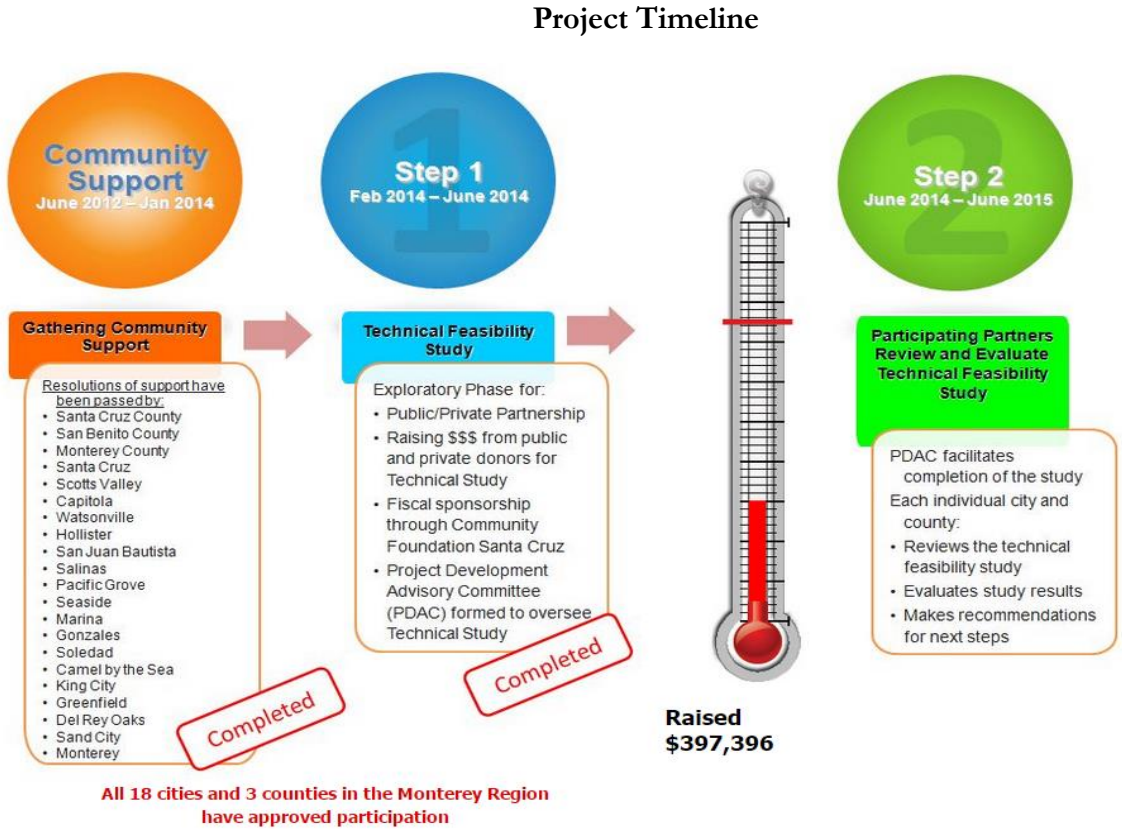

Figure 8
Monterey Bay Community Power – Project Timeline

While understanding there is still a lot more to be done, the leaders of the Monterey Bay CCA are optimistic about the future. Much of their renewable energy will be produced locally, with several large solar installations in progress, as well as several landfills in the region that produce and collect renewable methane and whose owners are already on board. There was an initial pushback from the local IBEW, but

[32] (Johnson, 2014)
[33] (Monterey Bay Community Power, 2014)

after outreach from Monterey Bay CCA staff, the unions embraced the idea and helped support legislation.[34]

One of the most effective tactics that the Monterey Bay CCA employed was the use of an outstanding website. With a user-friendly layout and design, the organization was able to effectively reach their constituents and improve understanding of everything from the basics of a CCA to Project Timelines and an extensive Resources section. By answering all of the questions that people and legislators had about the policy and program, early support was seen and resolutions were passed at all 18 cities and 3 counties. The CCA continues to raise money for the initial transition and plans to have next steps and recommendations by June 2015

San Francisco

In 2004, San Francisco began its CCA. Different from the others which were created to reduce consumer costs, San Francisco's CCA was more focused on green energy and set a goal of offering all customers 100 percent renewable energy. The initial program implementation discussion considered phasing in the program to residential customers in San Francisco, beginning with a modest 30 megawatt program (about 90,0000 residential customers). However, 10 years after the launch of CCA, with an expense of more than 4.1 million to compete with PG&E, the work of CleanPowerSF has been suspended.

While the initial efforts were suspended, political conflicts continue between different groups. Assemblyman Tom Ammiano—a member of the Board of Supervisors who helped to create CleanPowerSF—has expressed his displeasure in the SFPUC. And he introduced a placeholder state bill to authorize an alternative local entity other than the SFPUC to approve CleanPowerSF (which could have been achieved through signing a joint-powers agreement with an established community choice aggregation program, such as the one in Marin County). Additionally, there has been a fight between the mayor and Board of Supervisors, as the proposed budget of the San Francisco Public Utilities Commission was rejected by a board committee this May.

San Francisco is rather prudent and unclear of the next step. According to Michael Hyams, the Acting Manager of Regulatory and Legislative Affairs of San Francisco, the big challenge for the next step would be achieving agreement within the city on program objectives and design. Furthermore he thinks that the estimated rate is unclear. While San Francisco seemed to be the perfect place to institute a CCA, the goal of providing all customers with 100percent renewable energy was not reasonable and failed to be executed. It is possible that an incremental introduction of the renewable energy could have produced different results.

San Joaquin Valley Power Authority

In April of 2007, the California Public Utilities Commission (CPUC) approved the first implementation plan for a community choice aggregation program in the state. Kings River Conservation District (KRCD) on behalf of the San Joaquin Valley Power Authority (SJVPA) submitted the implementation plan to form a

[34] (Johnson, 2014)

CCA that would serve the San Joaquin Valley and the Greater Fresno Region. At the time of approval, the authority had eleven city members and one county.[35]

After approval in April 2007, the planned launch date was set for June 2009, but the two years from approval to launch evolved into a struggle for the authority. The agency not only had to contend with a tight credit market and unstable energy prices, but also had to face severe opposition from PG&E. The agency was forced to suspend its CCA program stating in a letter to the CPUC, "PG&E's marketing and lobbying efforts continue unabated creating obstacles and demands upon our limited resources."[36]

The authority alleged that PG&E's marketing efforts were unlawful and misleading to potential customers in the service area. In 2007, the authority filed a complaint regarding these alleged unlawful marketing tactics to the CPUC. A settlement agreement was filed in 2008 between the authority, PG&E, and the CPUC, which specifies mutually agreed upon marketing standards.[37] The downturn in the economy, the legal proceedings, and the overall opposition from PG&E forced the authority to suspend the CCA program in 2009, which is where the program stands today.

[35] (San Joaquin Valley Power Authority)
[36] (Flynn, 2013)
[37] (San Joaquin Valley Power Authority v Pacific Gass and Electric Company, 2008)

Community Choice Aggregation in Torrance

Why Now?

One of the six elements in the general plan adopted by Torrance in 2010, the Community Resources Element provides goals, objectives, and policies to protect the natural and community resources that define Torrance. The Community Resources Element expresses the commitment the City of Torrance has made "to provide the highest quality and variety of cultural, recreational, educational, informational, and social programs to respond to residents' needs."[38] The Community Resource Element in the general plan combines three previously separated elements: the Parks and Recreation, the Resource Conservation, and the Open Space Elements. The Resource Conservation section addresses issues regarding the historic, aesthetic, and natural resources that contribute to community health and wellbeing.

The Resource Conservation section details the environmental programs and policies the city is pursuing to promote clean air, water, recycling, and energy conservation. The section also describes how the city is complying with State and federal laws that mandate certain environmental standards be met. The overarching goal of the Resource Conversation section is stated as the following:

> *"The careful conservation and managed used of resources to ensure a quality environment for Torrance residents."*[39]

To achieve this goal, a set of objectives has been established, with corresponding policies to support the objectives. The formation of a CCA in Torrance would align with **Objective CR.21**, which is listed as: *The efficient use and conservation of energy resources to reduce the consumption of natural resources and fossil fuels.* **Policy CR.21.3** is one of the nine approved policies to support this objective and the policy that validates CCA formation**.** The policy states: *Support the development and use of non-polluting, renewable energy resources.* CCAs promote the development of renewable energy sources and strive to reduce the use of natural resources and fossil fuels.

Furthermore, a CCA fulfills the expectations of "Stewardship of the Environment"—the new strategic priority articulated in Torrance's 2008 Strategic Plan. One of ten strategic priorities, "**Stewardship of the Environment**" states the goals needed by Torrance to appropriately respond to a variety of issues related to the physical environment. The goal most likely to be met through the formation of a CCA would be the "**Create a positive Environment for Green Industries**" goal. A CCA would be a major step to achieving this goal as it effects positive change in each sub-goal listed under the overarching goal. The sub-goals are listed below:

- Recognize and reward practices that preserve and improve the environment.
- Provide incentives for businesses to "Go Green" through the use of environmentally friendly practices.
- Promote public and private partnerships to achieve greater synergy for "green" businesses and practices.

[38] (City of Torrance, 2010)
[39] (City of Torrance, 2010)

- Encourage and support green incubator business.
- Recruit and provide incentives for relocation of green collar business into the City, including sustainable residential, industrial, and commercial building industries.

The 2008 Strategic Plan also declares that the "Stewardship of the Environment" strategic priority is an opportunity for Torrance to be a leader in facilitating local and regional solutions for environmental issues.

Currently, there are only two operating CCAs in the state of California, Marin Clean Energy and Sonoma Clean Power, and another one, Lancaster Choice Energy, which earlier in 2014 had its implementation plan approved and is now in the registration process through the California Public Utility Commission (CPUC) and Southern California Edison (SCE). Over the past few years, there have been several other cities and communities that have shown interest in CCAS, including San Diego, Monterey Bay, and the East Bay, and are in the initial stages of development.

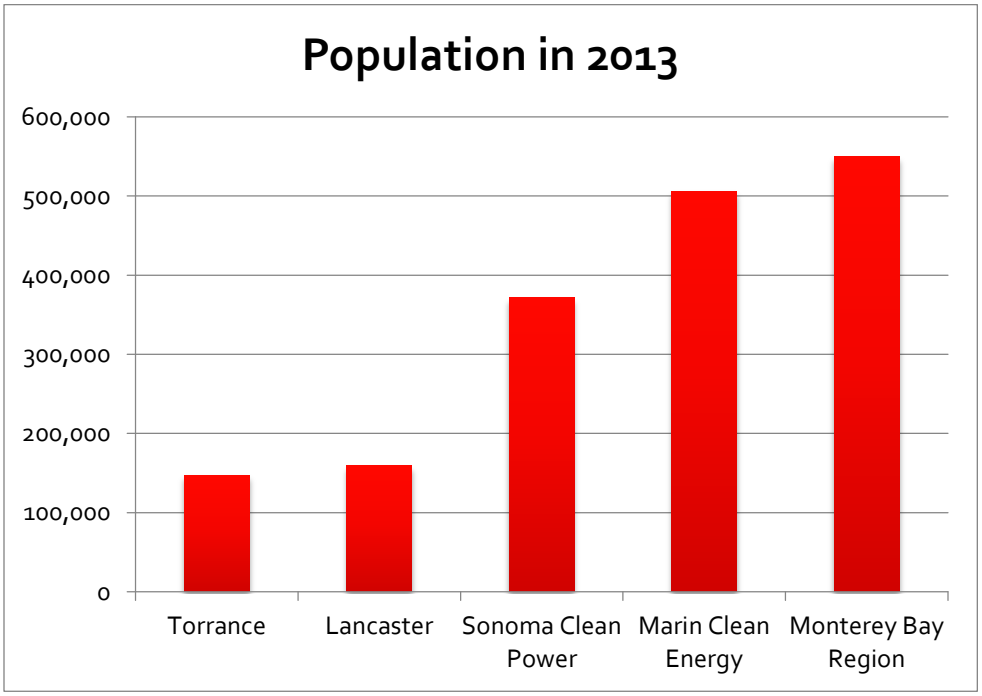

Figure 9
Population Comparison

In 2014, the movement began to make waves in the South Bay region with the help of the South Bay Clean Power (SBCP) working group. The group has spent the year advocating for CCA formation amongst the 15 cities of the South Bay, and possibly the city of Santa Monica. In fall 2014, the cities of Hermosa Beach and Manhattan Beach passed resolutions to participate in a community choice aggregation feasibility study, and feasibility study approval is imminent from Redondo Beach and Santa Monica. With surrounding

community support mounting, the City of Torrance has an opportunity to be on the forefront of the movement by also passing the resolution to move forward with the CCA feasibility study.

Potential Benefits

To diversify the California energy markets, in April 2011, Governor Edmund G. Brown Jr. signed Senate Bill X1-2, requiring that all electricity retailers in the state serve 33 percent of their loads from renewable energy by 2020 (See Figure 10). The bill applies to all investor-owned utilities (IOUs), public-owned utilities (POUs), electricity service providers, and CCAs in the state. These electricity retailers shall also adopt RPS goals until the 33percent requirement in 2020. By the end of 2013, 20 percent of all electricity sales must be from renewables and by the end of 2016, 25 percent of sales must be from renewables. Existing CCAs in the state not only meet this requirement but also provide options to greatly exceed the 33 percent target. Additionally, CCAs generate diversity in the state's energy portfolio and ultimately provide stability from a market previously dominated by natural gas.

RPS Standards	
California RPS Compliance Periods	**Procurement Quantity Requirement**
Compliance Period 1 (2011-2013)	2011 retail sales * 20.0percent 2012 retail sales * 20.0percent 2013 retail sales * 20.0percent
Compliance Period 2 (2014-2016)	2014 retail sales * 21.7percent 2015 retail sales * 23.3percent 2016 retail sales * 25.0percent
Compliance Period 3 (2017-2020)	2017 retail sales * 27.0percent 2018 retail sales * 29.0percent 2019 retail sales * 31.0percent 2020 retail sales * 33.0percent
Year 2021, and subsequent years	Annual retail sales * 33.0percent

Figure 10
RPS Standards

Meeting the state's RPS requirement of 33 percent many years in advance of the 2020 deadline is one of the numerous benefits offered by a CCA program. Other potential benefits include:

- **Local Control**

  CCAs use a public governance structure that provides citizens an opportunity to offer input into the mission and objectives of the program. Local elected officials and representatives are members of the governing body--a public Board of Directors. This governance structure gives CCA members a voice in key decisions faced by the CCA, such as where to procure energy, how to invest surplus revenues,

and which local renewable projects to pursue. Conversely, investor-owned utilities (IOUs) are for-profit corporations that make profits to shareholders and are governed by a private Board of Directors.

Existing CCAs in California tout their ability to control and exert authority on how resources are used locally. For example, Sonoma Clean Power claims that consumers spend $180 million per year on energy that now will be staying in the community. The agency also advertises to be able to exercise more authority in the use of $12 million in energy efficiency monies that is allocated annually by state programs for their consumers.[40]

- **Local Choice**

  In the traditional model, IOUs, such as Southern California Edison, control the local utility market, leaving consumers without choices on the source of the power, nor on how to reinvest the surplus revenues. CCAs provide consumers with another alternative if they are displeased with the service offered by the incumbent utility.

- **Economic Development**

  CCAs encourage the development of on-site and local energy generation projects, which often provides benefits to the property owner and local business. Renewable energy development projects allow owners to benefit from energy savings, through direct investment or by offering leasing rights to project developers. Local renewable energy development also provides investment in the local economy through the creation of clean energy jobs from installation and maintenance. Likewise, it is less costly to finance local renewable projects because the CCA has the ability to issue tax-exempt revenue bonds and has no shareholders to pay. The community chooses how surplus revenues are best spent, either through reinvestment in energy projects or lower rates to consumers.

  For the individual consumer, CCAs provide programs that incentivize the development of renewable generation by lowering the cost of financing. Net-metering and feed-in tariff programs allow for long-term, fixed pricing that encourage a consumer to finance generation projects, which results in local economic growth.

- **Environmental Benefits**

  Increasing procurement through local renewable energy sources drastically reduces the amount of greenhouse gas (GHG) emissions connected to electricity generation. Fossil fuel combustion in power plants is a prime source of GHG emissions. According to the EPA, fossil fuel combustion for electricity generation was the largest source of CO_2 emissions in the United States in 2012.[41]

[40] (Farrell, 2014)
[41] (United States Environmental Protection Agency, 2014)

- **Rate Stabilization and Lower Prices**

  CCAs develop and sustain a variety of energy sources, which stabilizes rate fluctuations that might result from an over-reliance on one energy source. For example, when the San Onofre nuclear plant shut down in 2013, it resulted in a 59 percent price increase to customers.[42] The fixed, long-term rates offered through CCA programs such as feed-in tariffs and net-metering also provide the stability and confidence that attracts local investors to pursue electricity generation projects. Additionally, competition is seen as a precursor for lower prices. Providing consumers an option will force electricity providers to consider the rates being charged and whether those rates will attract or detract consumers. Lastly, surplus revenues generated by the CCA can be used to invest in more renewable energy, which has shown a decline in power price over the long term, or to lower the rates charged to consumers. Surpluses generated by an IOU such as SCE do stay in the local community and are returned to shareholders. In 2013 Edison International paid out $440 million in dividends to its shareholders.[43]

Potential Challenges/Opposition

With each successive CCA in California, the formation and approval process is becoming more streamlined and quicker from conception to launch. By acting as the trailblazer, Marin Clean Energy developed the model that has been emulated by both Sonoma Clean Power and Lancaster Choice Energy. Consequently, the lead-time has been reduced drastically; Marin Clean Energy required five years from completed feasibility study to launch, Sonoma Clean Power required less than three years, and Lancaster Choice Energy is expected to launch in less than a year after the release of its feasibility study. While guidelines and successful models exist, CCA formation is not without its risk. Below are some of the major risks associated with CCA formation:

- **Competitive Rates**

  The success of a CCA hinges on its ability to offer competitive rates compared to the incumbent utility. The larger the customer base the greater likelihood that rates will be competitive due to the increased bargaining power the CCA will have with energy providers. CCAs can better control rates by developing their own electricity generation supply and by not entering into long-term, fixed-price contracts with energy suppliers. The start-up challenge facing every CCA is how to continuously attract and sustain their customer base, especially when considering that CCA funds cannot be generated until power contracts have been approved and consumers have fully transferred to the CCA.

[42] (Southern California Public Radio, July)
[43] (Edison International, 2013)

- **External Risks**

  The CCA must prepare for unplanned circumstances such as a third-party energy supplier defaulting on an energy contract or unable to provide the contracted renewable energy amount. If a default were to happen during a time of high energy prices in the market, the CCA would be forced to purchase energy prices at a much greater cost than planned. Additionally, it is not quite clear if the credit policies and customer deposits of the CCA would be sufficient enough to cover the uncollectible bills of customers who fail to pay. Moreover, the IOU could increase the costs of delivery services or find ways to reduce generation costs, making the CCA's goal of offering competitive rates more challenging.

- **How Much To Contract**

  Procuring the appropriate amount of energy is risky when the opt-out rate is uncertain. Buying too much energy would force the CCA to sale the excess amount for a loss, while buying too little would result in the CCA purchasing energy in the market at a premium. Fortunately, the load growth is fairly predictable if the appropriate resource planning is conducted for the CCA feasibility study.

- **Unfavorable Regulatory Changes**

  Unexpected regulatory action, such as change in the PCIA surcharge, could result in higher prices. The CPUC could potentially alter policies that discourage the formation of CCAs.

Funding Options

The costs associated with CCA formation have decreased substantially after the formation of MCE and SCP. Even when considering the reduced expenses, the program still requires investors to meet the initial pre-launch costs pertaining to the feasibility study, legal fees for establishing the Joint Powers Authority (JPA), and the creation of an administrative agency. These expenses are estimated to cost roughly around $1.5 million.

These upfront expenses will have to be covered initially by the communities participating in the JPA, short-term loans, and other investors, but will be repaid rapidly after the CCA begins generating funds from consumers. Marin County Energy used a $540,000 interest-free loan from the County of Marin and also issued three promissory notes for loans amounting to $750,000. MCE paid back all loans within the first year of operations.

Costs related to the start-up, but incurred post-launch, of the CCA program will continue for the first six to twelve months. Two of the major expenses are the buying power required initially to purchase electricity and posting the Community Choice program bond. There is an approximate 60-day lag between initial operations and the generation of revenues due to the 30-day meter reading cycle and 30-day

payment/collection cycle utilized by the IOU. The CCA will have to find funding sources for the initial 60 days of operation to cover this lag. The Community Choice program bond is a CPUC requirement that is posted to cover the costs in the event that the CCA program fails and customers are forced to return to the incumbent utility. The estimated program bond amount for MCE and SCP was $700,000. In total, pre-launch and post-launch specific costs are expected to reach $2.5 million.

In total, pre-launch and post-launch specific costs are expected to reach $2.5 million. The pre-launch expenses will have to be covered initially by the communities participating in the JPA, short-term loans, and other investors, but will be repaid rapidly after the CCA begins generating funds from consumers. Marin County Energy used a $540,000 interest-free loan from the County of Marin and also issued three promissory notes for loans amounting to $750,000. MCE paid back all loans for pre-launch costs within the first year of operations.

The post-launch costs can be covered through short-term bank financing, such as a credit line, or through the use of in-kind services offered by a third-party energy supplier. An example of a useful in-kind service would be a delay in the first payments or staff assistance. During the Request for Proposal (RFP) phase, CCAs can specify that suppliers able to provide certain services and accommodate the payment cycle will receive preference in the selection process. Opening up a credit line in two separate tranches, with one accessible pre-launch and the other accessible post-launch, through a community bank would be a favorable funding strategy. SCP was able to receive financing in two separate tranches through the First Community Bank. The first tranche was backed by the County of Sonoma and included a line of credit for $2.5 million. The second tranche expanded the line of credit to $7.5 million and is not guaranteed from SCP or any of its municipality members.

Torrance Projections and Specific Benefits

There are three potential benefits projected for the implementation of a CCA in Torrance– 1) financial benefit to the City of Torrance (See Figure 11), 2) jobs created with the development of additional renewable energy (RE) sources as a result of CCA related activities (See Figure 12), and 3) averted greenhouse gas (GHG) emission with the introduction of additional renewable energy source (See Figure 13). This is followed by the calculation method, principle assumptions for these projections, as well as the rationale behind them. Many of the assumptions adopted a linear increase model or an annual percentage increase model for preliminary estimation.

Estimated Financial Benefit (Million Dollars)

	2016	2017	2018	2019
Net Profit Per Year	17.83	37.52	35.32	42.57
Net Assets in Total	**17.83**	**55.36**	**90.68**	**133.25**

Figure 11

Estimated Additional Jobs Created

Percentage of RE in CCA (%KWH)	**33%**	**50%**	**75%**	**100%**
Total Jobs Created by Additional Solar PV	753	2,000	3,834	5,668

Figure 12

Estimated GHG Emission Averted (ton)

Percentage of RE in CCA (% KWH)	33%	50%	75%	100%
Total GHG Emission Averted (ton)	214,245	714,988	1,451,375	2,187,762

Figure 13

Financial Benefits

Estimated financial benefit is calculated as shown below.

Financial Projection for CCA in Torrance	**2016**	**2017**	**2018**	**2019**
Unit: USD				
Electricity Sales	202,257,350	240,465,423	281,318,197	308,683,953
Electricity Expenses	151,159,801	176,984,760	213,801,830	237,522,010
Other Operating Expenses	30,881,911	24,570,994	27,944,068	27,872,089
Operating Income	20,215,639	38,909,668	39,572,300	43,289,855
Non-Operating Expenses (Interest Expense)	-2,376,304	-1,392,862	-4,257,094	-717,684
Increase In Net Assets	17,839,335	37,516,807	35,315,205	42,572,170
Net Assets in Total	**17,839,335**	**55,356,141**	**90,671,346**	**133,243,516**

Figure 14
Financial Projection for CCA in Torrance

The projection of financial benefits from CCA assumed and adopted the financial growth pattern of an existing successful CCA project – Marin Clean Energy (MCE).[44] This primarily involves adoption of trend and **financial ratios**[45]:

- **Cost to Sale Ratio**, Projected Electricity Expense = Sales × MCE Cost to Sale Ratio

[44] Please see Appendix 1 for detailed MCE Financial Statements.
[45] Please see Appendix 2 for detailed Ratio Analysis on MCE Financial Statements

- **Other Operating Expenses / Sales,** general administrative costs should be proportionate with the scale of the project which is reflected by sales.
- **Non-operating Expenses** is basically interest expense resulted from long term loan. The amount of loan needed is directly related to the scale of the project which loops back to Sales.

Adjustments are made to rule out the financial impact caused by non-recurring items such as the enrollment of the City of Richmond which caused a significant outflow of cash.

Aside from profitability, **liquidity of the project** is also concerned. However, according to the experience of MCE, liquidity is assumed **adequate all the time** since 1) people always pay their electricity bills in cash and 2) the primary composite of the assets will be in the form of cash. Thus, no detailed projection on liquidity is presented in this section. Please see ratio analysis on MCE's financial status for reference.[46]

The calculation above is based on following assumptions:

Assumptions for Financial Projection	2016	2017	2018	2019
Total Purchase (KWH)	1,853,123,858	1,890,186,335	1,927,990,062	1,966,549,863
Assumed CCA percent of Total Purchase	70 %	80 %	90%	95%
Ave. Residential Rate($) / KWH	0.1800	0.1831	0.1862	0.1893
Ave. Non-Residential Rate($) / KWH	0.1520	0.1552	0.1584	0.1616
Residential percent of Annual KWH	14.00%	13.70%	13.40%	13.10%
Non-Residential percent of Annual KWH	86.00%	86.30%	86.60%	86.90%

Figure 15
Assumptions for Financial Projection

Total Purchase of electricity is projected assuming an annual increase by 2percent of the previous year, with Year 2012 as base year, since the total purchase in 2012[47] increased by 2percent from that of 2011[48].

Assumed CCA percent of Total Purchase is assumed to be 70percent initially based on experience with Lancaster and MCE. The ideal level of enrollment is assumed to be 95percent reached within 4 years.

[46] Ibid.
[47] (Southern California Edison, 2012)
[48] (Southern California Edison, 2012)

Average Residential Rate of Year 2016 is calculated, with limited data, setting Year 2011 as base year (16 cent) and assuming a 0.41 cent annual increase, which is the 11-year average from 2000 to 2011[49]. However, based on information provided by MCE, CCA rate is on average slightly lower than that of PG&E. Thus, starting from 2016, we cut figure by 0.1 cent for our assumption, which resulted in 0.31 cent annual increase.

Non-Residential Rate is calculated using similar method with Year 2011 as base year and 11-year average as assumed increase rate. The weight is calculated based on the composition of total energy consumption by non-residential category:

TOU-GS: GS-1 & GS-2: Street Lighting[50] = 65%: 19%: 0.5% = Lrg. Commercial & Agricultural: Sm/Med Commercial: Street Lighting[51]

Residential Percentage in total electricity purchased is applied with a 0.3percent annual decline. The rate is calculated through comparison of data from 2012 to that of 2011[52]:

Non-residential Percentage = 1 – Residential Percentage.

Thus, the **rate per KWH** is extrapolated using weighed calculation on above mentioned assumptions. **Electricity Sales** = Total Purchase × Assumed CCA percent × (Residential Rate × Residential percent + Non-residential Rate × Non-residential percent

Jobs Created by CCA with Additional RE Sources – Solar PV as an Example

The following is the calculation of a very rough ball-park estimation of jobs created from acquiring additional Solar PVs as renewable energy sources in the first four years. This extrapolation is based on a similar research conducted for the *CleanPowerSF 2007 Implementation Plan*[53] but under assumptions that represent the conditions of Torrance.

This estimation is solely based on Solar PV that contributes only 70% of the total additional RE, with the rest 30percent unaccounted for due to the lack of data. Since there are potential sites in Torrance for geothermal, wind and other renewable energy sources which are more job-intensive than Solar PV, the actual total amount of jobs created from the RE of CCA will be larger than even the optimist scenario (See Figure 16).

[6] (California Public Utilities Commission, 2012)
[50] (Southern California Edison, 2012)
[51] (California Public Utilities Commission, 2012)
[52] (Southern California Edison, 2012)
[53] (Local Clean Energy Alliance, 2011)

General Assumptions	2016	2017	2018	2019
Total Purchase (KWH)	1,853,123,858	1,890,186,335	1,927,990,062	1,966,549,863
Assumed CCA percent of Total Purchase	70%	80%	90%	95%
RE Generated at Present Rate(KWH)	400,274,753	408,280,248	416,445,853	424,774,770

Assumptions for Solar PV Job Estimation

CCA Phased in 4 Years				
Current Percentage of RE in Torrance	21.6%			
Scenarios of RE Percentage in CCA	33%	50%	75%	100%
Peak Hour Wattage to Average Wattage Ratio	140%			
Direct Job-Years / MW of Solar PV[54]	19.50	Mid of 13 – 26 job yrs./MW		
Indirect and Induced Jobs Multiplier[55]	0.80	Mid of 0.7 – 0.9 job yrs./MW		
Percentage of Solar PV in RE Sources	70%			

Figure 16
General Assumptions and Solar PV Job Estimation

Four scenarios regarding the level of CCA involvement in RE are presented in the job estimation. The logic behind the calculation is simple and represented in linear model by the following, **bold** indicating items provided in the assumption:

Jobs = Total job-years / **total years to phase the project**

Total job-years = Direct job-years × (1 + **Indirect & Induced Job Multiplier**)

Direct job-years = **Direct-job years / MW of Solar PV** × Total MW of Solar PV

Total MW of Solar PV = Additional RE by CCA × **Percentage of Solar PV in RE Sources**

Additional RE by CCA = Total RE by CCA – RE Generated at Present Rate

Total RE by CCA = Total Purchase × **Percentage of CCA in Total Purchase** × **RE percent in CCA**

RE Generated at Present Rate = **Total Purchase** × **Current Percentage of RE in Torrance**.

Average Wattage Capacity is calculated as Total Purchase KWH / 8760 Hours per Year. Since there are daily fluctuations in power demand, for the system to function properly, the maximum output capacity (Total MW) of combined energy sources must at least satisfy the peak wattage level which is about 140

[54] Ibid.
[55] Ibid.

percent of average level, according to the usage pattern of TOU-GS group which is the largest energy consumption party in the grid.[56]

For the convenience of this study, even with 70% of the additional RE generated by Solar PV, **voltage requirement is assumed satisfied** for all users in the gird including industrial users, though **technical details and feasibility of this assumption need to be validated by electric experts**.

CCA Job Projections at Varying RPS Levels

CCA Renewable Energy at 33%	**2016**	**2017**	**2018**	**2019**
Total RE Generated by CCA (KWH)	428,071,611	499,009,192	572,613,048	616,513,382
Additional RE by CCA (KWH)	27,796,858	90,728,944	156,167,195	191,738,612
Ave. Additional Wattage Capacity Required (MW)	3.17	10.36	17.83	21.89
Peak Additional Wattage Capacity Required (MW)	4.44	14.50	24.96	30.64
Direct Job-Years	418			
Direct Jobs Per Year	105	105	105	105
Indirect and Induced Jobs Per Year	84	84	84	84
Total Jobs Per Year	188	188	188	188
Total Jobs Created by Solar PV ALONE	**753**			

CCA Renewable Energy at 50%	**2016**	**2017**	**2018**	**2019**
Total Renewable Energy Generated by CCA (KWH)	648,593,350	756,074,534	867,595,528	934,111,185
Additional Renewable Energy Introduced by CCA (KWH)	248,318,597	347,794,286	451,149,674	509,336,415
Average Additional Wattage Capacity Required (MW)	28	40	52	58
Peak Additional Wattage Capacity Required (MW)	40	56	72	81
Direct Job-Years	1,111			
Direct Jobs Per Year	278	278	278	278
Indirect and Induced Jobs Per Year	222	222	222	222
Total Jobs Per Year	500	500	500	500
Total Jobs Created by Solar PV ALONE	**2,000**			

[56] (Southern California Edison, 2012)

CCA Renewable Energy at 75%	2016	2017	2018	2019
Total Renewable Energy Generated by CCA (KWH)	972,890,025	1,134,111,801	1,301,393,292	1,401,166,777
Additional Renewable Energy Introduced by CCA (KWH)	572,615,272	725,831,553	884,947,438	976,392,007
Average Additional Wattage Capacity Required (MW)	65	83	101	111
Peak Additional Wattage Capacity Required (MW)	92	116	141	156
Direct Job-Years	2,130			
Direct Jobs Per Year	533	533	533	533
Indirect and Induced Jobs Per Year	426	426	426	426
Total Jobs Per Year	959	959	959	959
Total Jobs Created by Solar PV ALONE	**3,834**			

CCA Renewable Energy at 100%	2016	2017	2018	2019
Total Renewable Energy Generated by CCA (KWH)	1,297,186,701	1,512,149,068	1,735,191,056	1,868,222,370
Additional Renewable Energy Introduced by CCA (KWH)	896,911,947	1,103,868,820	1,318,745,202	1,443,447,599
Average Additional Wattage Capacity Required (MW)	102	126	151	165
Peak Additional Wattage Capacity Required (MW)	143	176	211	231
Direct Job-Years				3,149
Direct Jobs Per Year	787	787	787	787
Indirect and Induced Jobs Per Year	630	630	630	630
Total Jobs Per Year	1,417	1,417	1,417	1,417
Total Jobs Created by Solar PV ALONE	**5,668**			

Figure 17
Job Projections at Varying RPS Levels

Averted Greenhouse Gas Emission

Greenhouse gas emission averted due to the introduction of additional RE as a result of the CCA is calculated as the following. Only one assumption made for this extrapolation – the GHG emission per KWH of electricity is 0.00046 tons which is about 1 lb., based on data of Year 2007. The calculation of Additional RE is the same as above (See Figure 18 below).[57]

[57] (South Bay Cities Council of Governments, 2011)

CCA Renewable Energy at 33%	2016	2017	2018	2019
Total Renewable Energy Generated by CCA (KWH)	428,071,611	499,009,192	572,613,048	616,513,382
Additional Renewable Energy Introduced by CCA (KWH)	27,796,858	90,728,944	156,167,195	191,738,612
GHG Emission Reduced Per Year (ton)	12,768	41,674	71,732	88,071
Total GHG Emission Reduced (ton)	**214,245**			

CCA Renewable Energy at 50%	2016	2017	2018	2019
Total Renewable Energy Generated by CCA (KWH)	648,593,350	756,074,534	867,595,528	934,111,185
Additional Renewable Energy Introduced by CCA (KWH)	248,318,597	347,794,286	451,149,674	509,336,415
GHG Emission Reduced Per Year (ton)	114,059	159,751	207,225	233,952
Total GHG Emission Reduced (ton)	**714,988**			

CCA Renewable Energy at 75%	2016	2017	2018	2019
Total Renewable Energy Generated by CCA (KWH)	972,890,025	1,134,111,801	1,301,393,292	1,401,166,777
Additional Renewable Energy Introduced by CCA (KWH)	572,615,272	725,831,553	884,947,438	976,392,007
GHG Emission Reduced Per Year (ton)	263,018	333,394	406,480	448,483
Total GHG Emission Reduced (ton)	**1,451,375**			

CCA Renewable Energy at 100%	2016	2017	2018	2019
Total Renewable Energy Generated by CCA (KWH)	1,297,186,701	1,512,149,068	1,735,191,056	1,868,222,370
Additional Renewable Energy Introduced by CCA (KWH)	896,911,947	1,103,868,820	1,318,745,202	1,443,447,599
GHG Emission Reduced Per Year (ton)	411,976	507,037	605,735	663,014
Total GHG Emission Reduced (ton)	**2,187,762**			

Figure 18

Options Available to Torrance

From the above projections, there are four options that are available to the City of Torrance: retain the status quo, join an existing CCA, join with regional efforts to form a large-scale CCA, or form an independent CCA in Torrance.

Retain Current Situation

The first option available to the City of Torrance would be to do nothing, and retain service as-is with Southern California Edison. This would be the easiest option and would not cost customers any more than their current rates with Edison. Additionally, with legislation signed into law in 2011 by Governor Brown, IOUs will have to provide 33% renewable energy by 2020, thought PG&E and Edison do not know how they will keep prices down to consumers with this requirment.[58] Staying with the current situation would mean that purchasing power for all energy provided to Torrance would remain with Edison, and would be subject to any price increases and lapses in service, as well as no incentive to provide increasingly cleaner energy at competative rates.

Join an Existing CCA

While the Bay Area CCAs allow cities to join their JPA, the option is only available to cities in the region. Currently, the best option for Torrance to join a CCA would be to join with the City of Lancaster, which will be allowing this option for other communities. However, Lancaster Clean Energy is still at least 2 years out from full implementation. Additionally, the geographical distance between Lancaster and Torrance poses several questions about feasibility and locations of "local" energy procurement. Presently, Lancaster is already planning on procurring most of its renewable energy from non-local sources. With the distances already planned for bringing in this energy, it is likely to not be very efficient to bring in energy from an even farther distance to Torrance.

Although this option does not seem feasible, it would raise questions about forming a larger, Los Angeles regional vision of CCAs. This would take a tremendous amount of effort at this scale, but would serve as a truly regional push for more renewable energy. However, this kind of movement would most likely need to be started at the LA County level to have any opportunity to succeed.

Form an Independent CCA

Based on the customer base and energy consumption of the City of Torrance, the formation of an independent CCA is a viable option. When compared to cunsuption rates of Marin County and Sonoma, Torrance could serve as one of the first CCAs established in Southern California. While there is already a local push to investigate CCAs, Torrance would lead the way by establishing a successful JPA and lead the way in the South Bay region. Due to this fact, Torrance could easily justify being the leader of the JPA and opening enrollment to other cities when the wish to proceed. This also opens up the financial opportunity

[58] (Baker, 2011)

of charging a buy-in fee for cities that would like to join the CCA, further cutting costs in the early stages of implementation

Join in Regional Efforts to Form Large-Scale CCA

As discussed previously, there has been a recent push by several cities in the South Bay region to conduct feasibility studies on the option of forming CCAs. This push by Manhattan Beach and Hermosa Beach, along with several others provides a great opportunity for Torrance to join. By using the leverage of being the largest energy consumer in the region, Torrance could take the lead, while sharing all of the costs from the start. When comparing the energy consumption between cities in the South Bay Region, Torrance is the major consumer of power (See Figure X-?).A regional effort would provide greater purchasing power to attain even more competative rates. This option appears the most straightforward and cost-effective. The South Bay region would serve as a striking example of cooperation and effort amongst jurisdictions in Southern California. This South Bay CCA would bring the purchasing power of a large population in Los Angeles County, allowing for the potential of job creation, competative or lower rates to residents, and the knowledge that the efforts are helping save our environment by using cleaner energy.

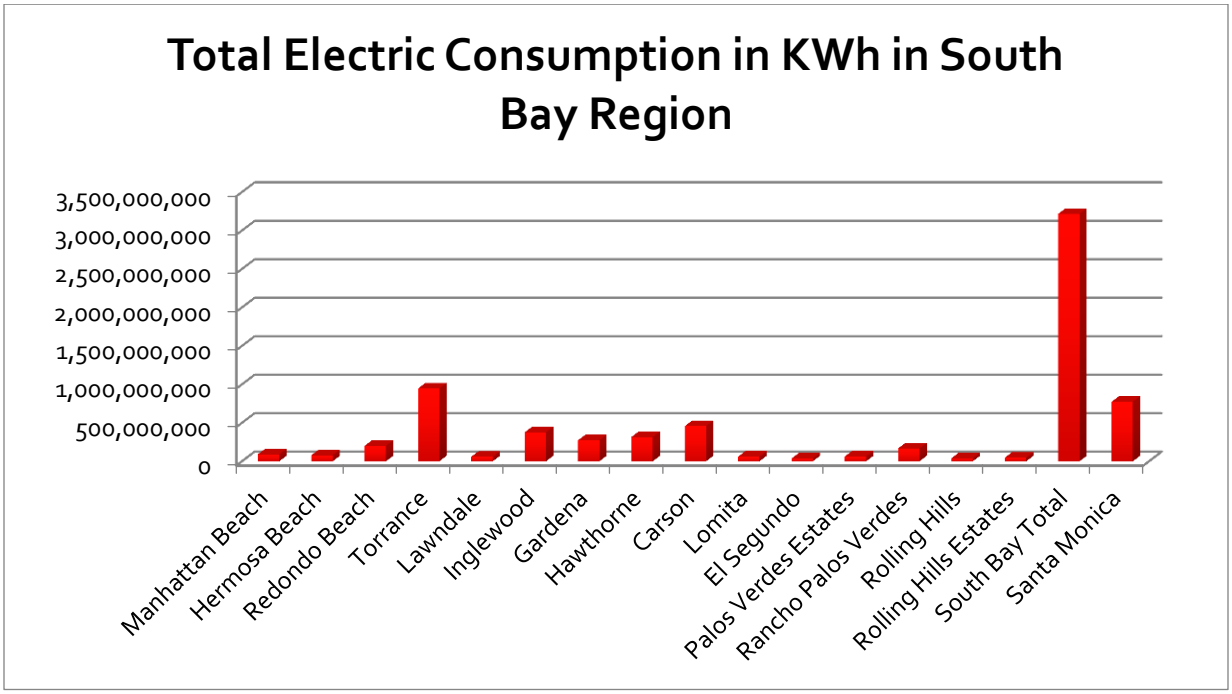

Figure 19
Total Electrical Consumption in South Bay Region

Recommendations

After careful consideration of the options and the history of successful attempts at similar policy, it is recommended that the City of Torrance pursue efforts to form a Resolution to support a Technical Feasibility Study for the formation of a CCA. Based on the current push in the South Bay region, it is recommended that Torrance join and even take a leading role in the regional effort. The purchasing power of this scale would provide for success in acquiring energy at competitive rates. Additionally, being one of the leading members of the JPA will give Torrance greater decision making power. While several other cities in the South Bay Region are considering for formation of CCAs, they have different motives for doing so. For example, Hermosa Beach has set a goal of becoming 100 percent carbon neutral[59], a choice that has seen problems with the case of San Francisco. If Torrance choses to go down the path of forming a CCA, it must determine what the motivating factors are in order to properly craft legislation. The path going forward is not a short one. As seen with all of the prior efforts in California, the process of implementing a CCA can take several years to start, and the start-up costs can be upwards of $2 million. While this is the case, the effort to form a CCA—either alone or with the other South Bay cities—should be considered by the City Council.

There are several things that can have a big effect on a successful implementation of a Community Choice Aggregation. Firstly, the Council must decide whether to proceed with investigating a CCA alone or with the surrounding cities. Next, it should join LEAN Energy which allows its members the resource of consultations. The Director of LEAN, Shawn Marshall began her involvement in creations of CCAs when she helped advocate for Marin Clean Energy. After MCE was implemented, Marshall helped establish LEAN Energy to assist and advocate for other CCAs around the state. With most of the current and investigating CCAs, LEAN has had a significant role in providing all of the necessary information, advocacy, and experience to successfully implement a CCA. While Lancaster began with the help of LEAN, the City decided against using them throughout the entire process. However, the knowledge that Marshall and her staff bring to communities cannot be overlooked. LEAN lays out a 3-leg approach:

1. Community advocacy and political outreach
2. Financial
    a. Understanding how to pay for start-up costs
    b. How to engage the banks to back the program
3. Technical and Legal Feasibility

Based on this approach, Torrance should act soon to establish advocacy for this move from the top. LEAN is able to come into the City and help train employees everything the need to know about the policy and

[59] (UCLA Environment 180 Senior Practicum, 2014)

how the implementation process works. LEAN would be able to help organize the entirety of the South Bay Region and establish financial steps and how to proceed to resolution for a Technical Feasibility Study. The political leaders in Torrance must serve as strong advocates for this policy. Having this strong backing will push legislation forward and begin the steps towards implementation. Additionally, early outreach to local unions will prove to be a significant part of success. If the CCA can establish early on that this program has few negative aspects, the unions can be given the correct knowledge and even serve as advocates for the change. Lastly, a lesson to be learned from San Francisco's failed attempt at a CCA is that is it better to start incrementally. By separating tiers of users such as Lancaster, and at different tiers of renewable energy like Marin and Sonoma, the CCA can be gradually implemented and has more of a chance of succeeding.

Torrance also has a potential for many sites that could be used to produce clean energy. The US Environmental Protection Agency (EPA) developed a database[1] through its REPowering America program, which cites contaminated lands that could be used for renewable energy development. These contaminated sites, such as landfills and old industrial sites, are not compatible for other types of development. In the city of Torrance, the database includes 84 sites that have the required information to check for solar PV projects, such as total acreage, distance to substation and solar radiation per square meter per day. Three sites included in the list of 84 are owned by the Exxon Mobile Refinery which creates the potential for the City of Torrance to create a partnership with Exxon to use one or all of these sites. This would be similar to the partnership formed between MCE and the Chevron Refinery in Richmond, CA.[60] From the 84 brownfield sites, the database calculates a total of 544 MW of solar PV potential in the city. Each site will have a remediation plan that will ultimately determine the appropriate type of development, but the database provides potential areas that Torrance could begin to pre-screen for renewable energy projects. It is also important to note that the database does not include other areas, such as carports, rooftops, and other open spaces, that would be suitable for solar projects (Please See Appendix 3 for full list of project sites).

[60] (Marin Clean Energy, 2014)

Next Steps

To establish a CCA, any city or county government should:

1. Conduct a Feasibility Study

The first step to forming a CCA is to conduct a feasibility study, which would state the goals of the program and the steps to achieve them. Furthermore, the study would detail the economic feasibility of the program and highlight the potential benefits and risks of implementation.

Southern California Edison Load Data would be used to form assumptions on future use, rates, costs, emissions, and jobs. The study would explore different procurement scenarios of CCA implementation and how each scenario would impact the service area. The various scenarios would estimate the potential number of customers, sales, revenue streams, return on investment, and jobs created. The study would also build a financial and cash-flow model and would detail how costs would be financed. It is important to remember that the assumptions are for future conditions and should be viewed as the most probable values within a range, not exact predictions. Also noteworthy is the $100,000-$150,000 cost associated with conducting a feasibility study.

2. Establish a JPA

All CCAs in the state of California are formed under a Joint Powers Authority (JPA). Forming a JPA allows multiple agencies to establish a mutual approach to address a common issue, fund a project, or act as a representative entity for a particular purpose. The various municipalities and counties interested in CCA formation would agree to become members of the JPA. For example, if the cities in the South Bay decided to start a CCA, a JPA would be formed to fairly govern the procedures and policies of the program.

The JPA is required to register with the CPUC as the managing and governing body of the CCA program. A Board of Directors would govern the program, yet the composition of the Board would vary depending if the JPA was formed at a county or municipal level. The Board of Directors at the county level would mostly include the Board of Supervisors (or their representatives) and at the municipal level would include the members from the city council. It should also be pointed out that the jurisdictions joining the JPA will incur up-front legal fees during the formation process.

3. Develop and Submit Implementation Plan

The next step in the process of CCA formation is developing and submitting an Implementation Plan. The plan describes all aspects of the program's set-up and operation, with AB 117 and the California Code 366.2 clearing stating that the plan must include the following:

- Organizational structure of the program, its operations, and funding.
- Rate setting and other costs to participants.
- Provisions for disclosure and due process in setting rates and allocating costs among participants.
- Methods for entering and terminating agreements with other entities.
- Rights and responsibilities of participants, including but not limited to, consumer protection procedures, credit issues, and shutoff procedures.
- Termination of the program.
- Description of third-parties that will be supplying electricity under the program including information about financial, technical, and operational capabilities.

The bill also claims that the program is required to have a process and consequences plan for aggregating customers into the CCA. This plan would be included in the Implementation Plan in order to detail the customer phase-in approach to the program. Specifically, the plan would list the number of enrollments that needed to occur each year, or each phase, until all customers in the service area had been enrolled. The enrolled numbers would be adjusted accordingly to the municipalities and counties that choose to join the program during the rollout phase. Additionally, the plan would need to include contingency plans if the amount of enrolled numbers were not met during a particular phase.

The Implementation Plan will be adopted at a duly noticed public hearing and will be submitted to the CPUC for approval. Along with the submittal of the Implementation Plan, the CCA would need to develop and submit a Statement of Intent. To comply with AB 117, the Statement of Intent would be required to specify that the program provides provisions for universal access, fair treatment of all customers, reliability, and fulfill all other requirements mandated by California law or by the CPUC. The Statement of Intent would be submitted to the CPUC, most likely with the Implementation Plan.

4. Complete CCA registration through CPUC

The CPUC has established a process for registering and implementing a CCA. Once the Implementation Plan and Statement of Intent have been filed with the CPUC, the CCA must also provide evidence of bond/insurance in the event that the program is not able to meet its service requirements and customers have to be reimbursed. Additionally, during the registration process, the CCA would have to provide documentation of a service agreement with the incumbent utility. Once all of these documents have been submitted, the CPUC will review them and will send a letter of approval if all requirements have been met.

5. Carry out Implementation Plan for CCA

Once the CCA has been approved, the following steps need to be carried 6-12 months before the sale of power.

a. Hire Staff

The Boards of Directors will first hire an Executive Director or CEO, and then begin to staff the agency appropriately. Staff would be required for the following functions: marketing and community outreach, finance and budget, procurement, forecasting, local energy initiatives, and regulatory affairs. Consulting firms can also be hired to conduct some of the more technical work, such as forecasting and developing rate structure.

b. Establish Renewable Portfolio Goals

The Board of Directors will have to establish the percentage amount of renewable energy that will be provided by the CCA. Marin Clean Energy set its initial rate at 50 percent clean energy, while Sonoma Clean Power established a 33 percent rate. Influential factors in this decision are how and where the renewable energy would be procured, as that would impact the rates offered to consumers.

c. Plan Procurement

A third-party power provider will need to supply the necessary energy while the CCA develops local renewable resources. Initially, the CCA would be to forecast the number of customers, determine the demand, develop a request for proposal, and consider bids from third parties to provide the required amount of energy. The third-party provider would need to guarantee the procurement of the renewable energy to meet the customer demand.

d. Set Initial Rates

After the procurement costs are established, the CCA would need to determine the electrical rates offered to customers. It is important to note that rates must be structured to compete with the incumbent utility and cover the costs of the program.

e. Marketing and Customer Notification

The CCA will need to develop a marketing plan to familiarize potential customers with the program and its benefits. Staff will need to be a presence in the community, meeting with local officials and business leaders to ensure that the program is fully understood. A well designed website that is user-friendly and informative will also disseminate program information and provide program updates.

Three months prior to the service commencement, two notices that explain the workings and rates of the CCA will need to be mailed. The notices will also explain the opt-out process if customers do not wish to partake in the program. If the customers do not opt of the program, they will be enrolled automatically. Within two months of the program launch, two more notices explaining the opt-out process will be sent out. If customers opt-out within this time, or prior, they will be allowed to return to the incumbent utility service without a fee. Customers can return any time after these four notices, but they will be charged a termination fee to offset the costs of changing service providers.

Appendix

Appendix 1 – Financial Statements of Marin Clean Energy[61]

Balance Sheet	2010	2011	2012	2013	2014Q1
Assets	**632,900**	**3,739,322**	**7,582,064**	**18,076,605**	**22,492,248**
Current Assets	493,768	3,308,530	7,153,300	17,276,728	21,154,743
Cash Equivalents	493,768	1,214,268	3,790,860	9,817,159	8,248,488
Accounts Receivable	-	1,530,712	2,180,568	4,572,796	9,096,571
Accrued Revenue	-	555,300	1,151,397	2,857,212	3,778,199
Prepaid Expenses	-	8,250	30,475	29,561	31,485
Non-Current Assets	139,132	430,792	428,764	799,877	1,337,505
Capital Assets	-	32,890	32,566	68,679	58,807
Prepaid Expenses	11,750	-	-	-	-
Security Deposits	127,382	134,702	132,998	132,998	132,998
Debt service reserve account	-	263,200	263,200	598,200	1,145,700
Liabilities	**1,594,151**	**3,420,484**	**3,664,139**	**10,163,731**	**12,934,212**
Current Liabilities	304,151	1,599,794	2,283,437	7,079,985	10,909,904
Accrued Liabilities	48,166	-	-		
Accounts Payable	255,985	180,224	201,158	905,401	1,301,607
Accrued Cost of electricity	-	985,013	1,568,514	4,300,363	5,723,371
Other Accrued Liabilities	-	17,589	73,776	152,595	515,618
User taxes and energy surcharge due to other governments	-	-	-	4,966	566,962
Notes Payable Due within 1 yr.	-	416,968	439,989	1,073,094	1,069,125
Deferred Revenue	-	-	-	643,566	1,733,221
Non-Current Liabilities	1,290,000	1,820,690	1,380,702	3,083,746	2,024,308
Notes Payable	750,000	1,820,690	1,380,702	3,083,746	2,024,308

[61] All information obtained from *MCE Financial Report*, 2010 – 2014, http://marincleanenergy.org/key-documents

Loan from County of Marin	540,000	-			
Net Assets	**-961,251**	**318,838**	**3,917,925**	**7,912,874**	**9,558,036**
Restricted for debt Services			263,200	598,200	598,200
Invested in Capital Assets	-	32,890	32,566	68,679	58,807
Unrestricted	-961,251	285,948	3,622,159	7,245,995	8,901,029

Income Statement	2010	2011	2012	2013	2014Q1
Operating Revenues	**-**	**14,323,650**	**22,918,843**	**52,579,310**	**85,561,759**
Electricity Sales	-	14,323,650	22,918,843	52,392,025	84,643,812
Energy Efficiency Program Revenue	-	-	-	187,285	917,947
Operating Expenses	**786,630**	**12,892,000**	**19,210,349**	**48,429,076**	**83,731,036**
Cost of Electricity	-	10,704,976	16,868,479	43,224,840	76,088,268
Energy Efficiency Program Revenue	-	-	-	187,285	-
Professional Services	662,272	1,598,947	1,535,634	3,708,760	5,533,964
Staff Compensation	-	496,314	634,232	1,041,907	1,660,945
Contract staff compensation	112,133	-	-	-	-
General and Admin. Expenses	-	91,763	172,004	266,284	447,859
Miscellaneous expenses	12,225	-	-	-	
Operating Income	-786,630	1,431,650	3,708,494	4,150,234	1,830,723
Non-Operating Revenues (Expenses)	**-2,156**	**-151,561**	**-109,407**	**-155,285**	**-185,561**
Contributions	2,074	22,260	-	20,000	-
Consideration for Loan Guarantees	-	-56,656	-	-	-
Interest Income	1,674	-	-	900	8,965
Interest Expense	-5,904	-117,165	-109,407	-176,185	-194,526

Increase (Decrease) in Net Assets	**-788,786**	**1,280,089**	**3,599,087**	**3,994,949**	**1,645,162**
Net Assets at the beginning of the Period	-172,465	-961,251	318,838	3,917,925	7,912,874
Net Assets at the end of the Period	-961,251	318,838	3,917,925	7,912,874	9,558,036

Cash flow Statement	2010	2011	2012	2013	2014Q1
Cash Flows from Operating Activities	-622,489	244,614	3,112,209	4,232,222	226,383
Cash Flows from Non-capital Financing Activities	944,420	499,137	-526,374	1,824,964	-1,797,004
Cash Flows from Capital & Related Financing Activities	-	-23,251	-9,243	-31,787	-7,015
Cash Flows from Investing Activities	1,674	-	-	900	8,965
Net Change in Cash and Cash Equivalents	323,605	720,500	2,576,592	6,026,299	-1,568,671
Beginning of the year	170,163	493,768	1,214,268	3,790,860	9,817,159
End of the year	493,768	1,214,268	3,790,860	9,817,159	8,248,488

Appendix 2 – Ratio Analysis on MCE Financial Statements

Ratio Analysis	2010	2011	2012	2013	2014Q1
Current Ratio	1.62	2.07	3.13	2.44	1.94
Quick Ratio	1.62	1.72	2.62	2.03	1.59
Cost to Sale Ratio		**0.75**	**0.74**	**0.83**	**0.77**
Operating Margin		0.10	0.16	0.08	0.02
Current Liability / Liability	0.19	0.47	0.62	0.70	0.84
Operating CF / Operating Income		0.17	0.84	1.02	0.12
Financial Leverage	-1.66	10.73	0.94	1.28	1.35
Other Operating Expenses / Sales		**0.15**	**0.10**	**0.10**	**0.09**
Annual Asset Increase		5.91	2.03	2.38	1.24
Annual Liability Increase		2.15	1.07	2.77	1.27
Annual Net Asset Increase		-	12.29	2.02	1.21
Annual Net Asset Increase		-	2.81	1.11	0.41
Net Profit from Sales	0.00	0.09	0.16	0.08	0.02
Non-Operating Expenses VS. Non-Current Liabilities	0.00	-0.12	-0.06	-0.11	-0.06
Non-Current Liabilities VS. Sales		0.10	0.10	0.13	0.04
Annual Cash Build-up		2.46	3.12	2.59	0.84

Appendix 3 – Potential Solar PV Brownfield Sites in Torrance

Site Name	Address	City	Distance to Substation (miles)	Max DNI Solar (kWh/m2/day)	Estimated Solar PV Capacity Potential (MW)
AKZO COATINGS, INC.	20846 SOUTH NORMANDIE AVENUE	TORRANCE	0.53	4.91	
ALCOA FASTENERS SYSTEMS	3000 W Lomita Bl	TORRANCE	0.35	4.73	2.00
ALLIED SIGNAL/AEROSP SYS & EQ, TORRANCE	2525 W. 190th Street/Dept 62t19	TORRANCE	0.01	4.73	
ALS INDUSTRIES INCORPORATED	1942 West Artesia Boulevard	TORRANCE	0.78	4.73	0.61
AMERICAN HONDA MOTOR CO., INC.	1919 Torrance Boulevard (Bldg 510 parking lot)	TORRANCE	0.86	4.73	
AMERICAN HONDA MOTORS COMPANY	840 VAN NESS AVENUE	TORRANCE	0.51	4.73	16.66
AMERICAN STANDARD INCORPORATED	360 CRENSHAW BOULEVARD	TORRANCE	0.54	4.73	
AMOCO CHEMICALS CORP (2)	1225 WEST 196TH STREET	TORRANCE	0.44	4.91	0.35
AMP, INC., C/O TYCO ELECTRONICS	435 Maple Avenue	TORRANCE	0.55	4.73	
ARMCO, INC.	1541 BORDER AVENUE	TORRANCE	0.91	4.73	6.63
BOEING NORTH AMERICAN, INC., LONG BEACH DIVISION	19503 S. Normandie	TORRANCE	0.61	4.73	
CAPITOL METALS PROCESSING, INC.	20000 S. Western Avenue	TORRANCE	0.26	4.73	
DON WILSON BUILDERS	22700 Meyler St.	TORRANCE	1.19	4.91	
DOW CHEMICAL - TORRANCE	305 CRENSHAW BOULEVARD	TORRANCE	0.36	4.73	
DOW CHEMICALS CO.		TORRANCE	0.53	4.91	

ECOLOGY CONTROL INDUSTRIES (ECI)	19500 NORMANDIE AVENUE	TORRANCE	0.45	4.91	
EXXON MOBIL OIL CORP	3700 W 190TH ST	TORRANCE	0.24	4.73	
EXXON MOBIL REFINERY OFF-SITE IMPACT	3700 W. 190th St., Safety Bldg Rm #117	TORRANCE	0.00	4.73	125.00
EXXONMOBIL OIL CORP TORRANCE REFINERY	3700 W. 190TH ST.	TORRANCE	0.00	4.73	122.33
FOUNDRY SERVICE & SUPPLIES	1906 OAK STREET	TORRANCE	0.50	4.73	
FREEMAN PRODUCTS / AVNET INC.	2040 Artesia Boulevard	TORRANCE	0.73	4.73	0.38
GARDENA VALLEY #4 LANDFILL	833 W. Torrance Blvd.	TORRANCE	0.42	4.91	
GARRETT AVIATION SVCS. - CFC AVIATION SVCS.	20251 Western Avenue	TORRANCE	0.32	4.73	
GCS, INC.	23155 Kashiwa Court	TORRANCE	0.74	4.73	
HARVEY MACHINE CO		TORRANCE	0.50	4.73	
HI-SHEAR CORP.	2600 Skypark Drive	TORRANCE	0.20	4.73	3.33
HI-SHEAR TECHNOLOGY CORP.	24225 Garnier Street	TORRANCE	0.32	4.73	
HONEYWELL - TORRANCE	3201 WEST LOMITA BLVD.	TORRANCE	0.73	4.73	
HUGHES AIRCRAFT CO., MICROWAVE PROD DIV.	24120 Garnier Street	TORRANCE	0.29	4.73	
HUGHES AIRCRAFT CO./SCG	19300 GRAMERCY PLACE	TORRANCE	0.28	4.73	1.16
HUGHES AIRCRAFT COMPANY (FORMER)	3100 W LOMITA BLVD BLDG 231	TORRANCE	0.50	4.73	4.33
HUGHES SPACE AND COMMUNICATIONS CO(HSC)	19300 GRAMERCY PLACE	TORRANCE	0.39	4.73	
HYDRO RUBBER & PLASTICS	1200 FRANCISCO STREET	TORRANCE	0.36	4.91	

HYDROCHEM INDUSTRIAL SERVICES INC	301 CRENSHAW BLVD	TORRANCE	0.56	4.73	
INTERNATIONAL LIGHT METAL CORP	19200 S WESTERN AVE	TORRANCE	0.51	4.73	
INTERNATIONAL LIGHT METALS	19200 SOUTH WESTERN AVENUE	TORRANCE	0.50	4.73	
JCI JONES CHEMICALS INC	1401 DEL AMO BLVD	TORRANCE	0.06	4.73	
JONES CHEMICAL	1401 DEL AMO BLVD	TORRANCE	0.19	4.91	
KNOLLS LODGE MOBILE HOME PARK	23701 S. WESTERN AVENUE	TORRANCE	1.10	4.73	
LOMITA BLVD. DEVELOPMENT	2740-2750 W. LOMITA BLVD.	TORRANCE	0.17	4.73	
M/A-COM PHI	1742 Crenshaw Boulevard	TORRANCE	0.61	4.73	
MARTIN BRASS FOUNDRY	2341 Jefferson Street	TORRANCE	0.46	4.73	
MAT REDIS & DISP CEN		TORRANCE	0.26	4.73	
MOBIL	3700 WEST 190TH STREET	TORRANCE	0.46	4.73	
MOBIL OIL, TORRANCE REFINERY	3700 W. 190th Street	TORRANCE	0.25	4.73	
MOMIN LODGE	1918 Artesia Boulevard	TORRANCE	0.87	4.73	0.36
MONTROSE CHEMICAL CORP.	20201 S NORMANDIE AVE	TORRANCE	0.00	4.91	205.83
MOOG, INC., AIRCRAFT GROUP TORRANCE OPERATIONS	20263 Western Avenue	TORRANCE	0.19	4.73	
NIR AIRCRAFT PLT		TORRANCE	1.49	5.39	
NORTHROP CORP/AIRCRAFT DIV	540 HAWAII AVE	TORRANCE	0.52	4.73	
NORTHROP CORP-AIRCRAFT DIV	19200 SO WESTERN AVE	TORRANCE	0.31	4.73	
NORTHROP GRUMMAN CORPORATION (K1)	2135 DOMINGUEZ AVE	TORRANCE	0.69	4.73	
NORTHROP GRUMMAN CORPORATION	2203 DOMINGUEZ AVE	TORRANCE	0.73	4.73	

(K3)					
NSC LONG BCH		TORRANCE	0.20	4.98	
PHENOMENEX, INC. (BLDG. 4)	431 Amapola Ave.	TORRANCE	0.61	4.73	
PLASMA TECHNOLOGY, INC.	1754 CRENSHAW BLVD.	TORRANCE	0.55	4.73	
PPG INDUSTRIES	465 CRENSHAW BLVD	TORRANCE	0.49	4.73	2.41
PPG INDUSTRIES INC	465 CRENSHAW BLVD	TORRANCE	0.57	4.73	
REDMAN EQUIPMENT & MANUFACTURING COMPANY	19800 Normandie Avenue	TORRANCE	0.30	4.91	0.53
REYNOLDS METALS COMPANY	500 CRENSHAW BLVD	TORRANCE	0.59	4.73	0.94
ROCK LOMITA	2740 Lomita Boulevard	TORRANCE	0.06	4.73	4.16
ROYAL BOULEVARD CLASS III DISPOSAL SITE	ROYAL BLVD BTWN 209TH AND 210TH STREETS	TORRANCE	0.69	4.91	1.21
SPECTRUM PLATING CO.	527 Van Ness Ave.	TORRANCE	0.50	4.73	
STANDARD BRANDS	4100 WEST 190TH STREET	TORRANCE	0.55	4.73	1.66
STAR BIOCHEMICALS, SUBDIV. OF MALLINCKRODTE	20916 Higging Ct	TORRANCE	0.61	4.73	
SUNTHETIC RUBBER PLANT		TORRANCE	0.66	4.91	
THE BOEING CO	3100 W LOMITA BLVD	TORRANCE	0.46	4.73	4.33
THE DAILY BREEZE	5215 Torrance Boulevard	TORRANCE	0.72	4.73	
THE DOW CHEMICAL COMPANY	305 CRENSHAW BLVD	TORRANCE	0.20	4.73	8.66
THE DOW CHEMICAL COMPANY	305 CRENSHAW BOULEVARD	TORRANCE	0.23	4.73	8.66
THE EMPTY ATTIC	736 W. Del Amo Boulevard	TORRANCE	0.08	4.91	1.66
TORRANCE ALUMINUIM PLNT		TORRANCE	0.42	4.73	

TORRANCE CITY AIRPORT		TORRANCE	0.79	4.73	
TORRANCE LANDFILL	20500 MADRONA STREET	TORRANCE	0.55	4.73	
TORRANCE MEMORIAL MEDICAL CENTER	3330 Lomita Boulevard	TORRANCE	0.65	4.73	
TRICO PACCAR	1206 WEST 196TH STREET	TORRANCE	0.37	4.91	0.38
TYLAN CORPORATION	19220 SOUTH NORMANDIE AVENUE	TORRANCE	0.58	4.91	
ULTIMATE CLEANERS	3525 PACIFIC COAST HIGHWAY	TORRANCE	0.62	4.73	
UNION CARBIDE, TORRANCE	3651 DEL AMO BLVD	TORRANCE	0.43	4.73	16.66
UNION CARBIDE/CHEM'S & PLAST/TORRANCE	19500 MARINER AVENUE	TORRANCE	0.32	4.73	2.83
UNION OIL PIPELINE, TORRANCE TANK FARM	2650 WEST LOMITA BOULEVARD	TORRANCE	0.00	4.73	
UPJOHN COMPANY CPR DIVISION	555 ALASKA AVENUE	TORRANCE	0.67	4.73	
VERTEX MICROWAVE PROD., INC	3111 Fujita Street	TORRANCE	0.66	4.73	
VOUGHT AIRCRAFT INDUSTRIES INC	640 ALASKA AVENUE	TORRANCE	0.67	4.73	0.98

Total: **544.04**

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